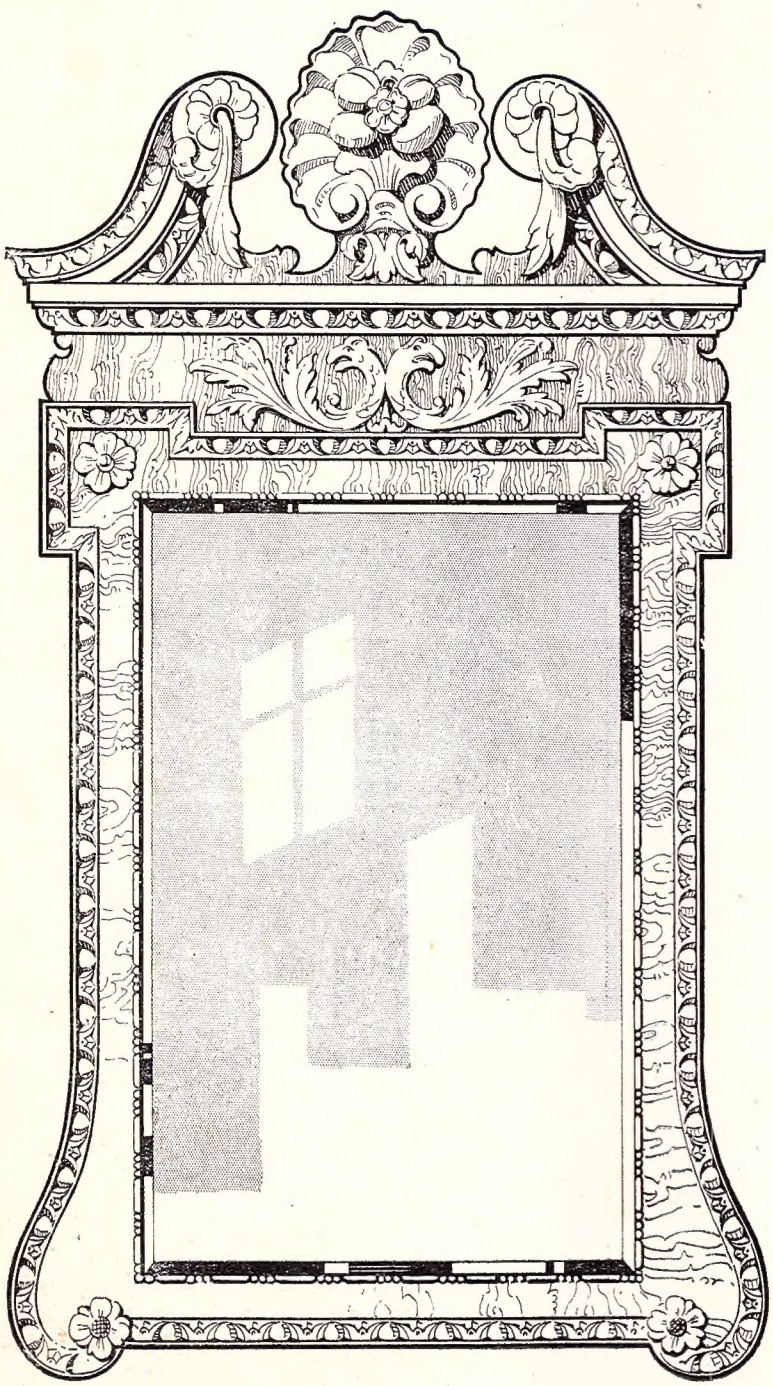
WOODWORKER

VOL. LX. No. 747

FEBRUARY
1956

ONE SHILLING



Features this month

COFFEE TABLES

PEDESTAL CUPBOARD

WORKSHOP PRACTICE—Marking out

BATHROOM CUPBOARD

POLISHING—Grain filling

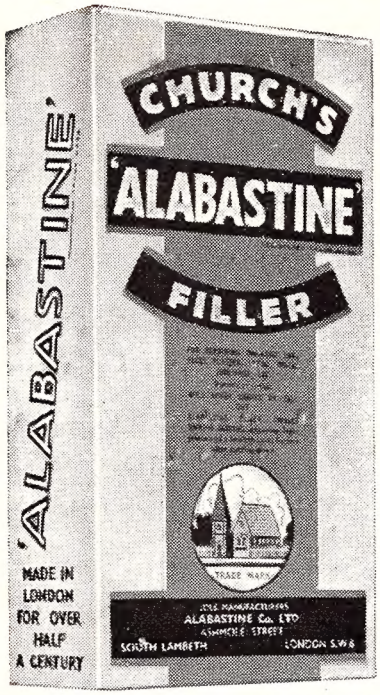
WORKSHOP FOLDER—Halved joint

WOOD TURNING—Your tools

CARVED DISHES

Measured drawing

18th CENTURY MIRROR FRAME



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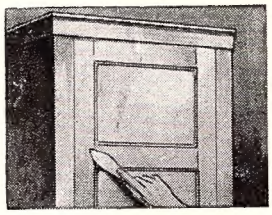

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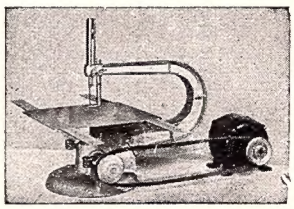

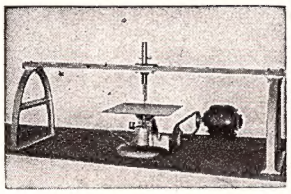

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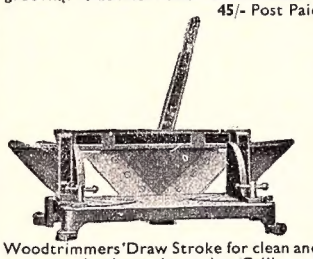

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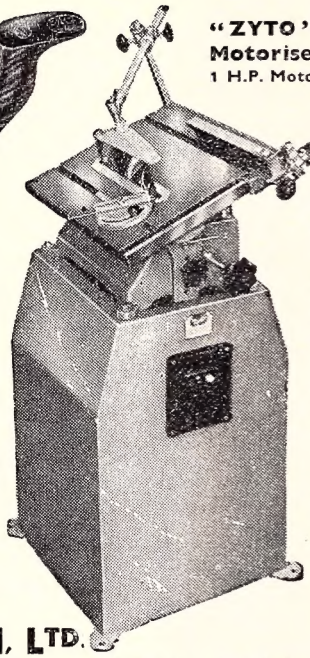

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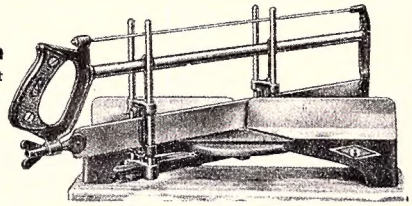

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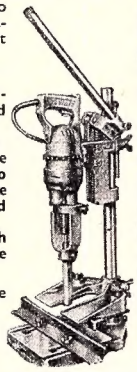

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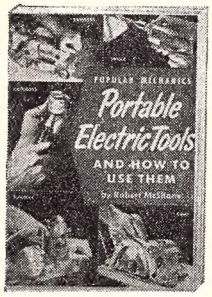

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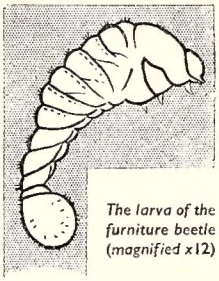

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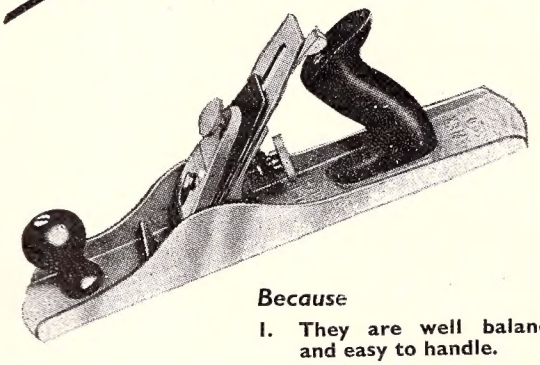

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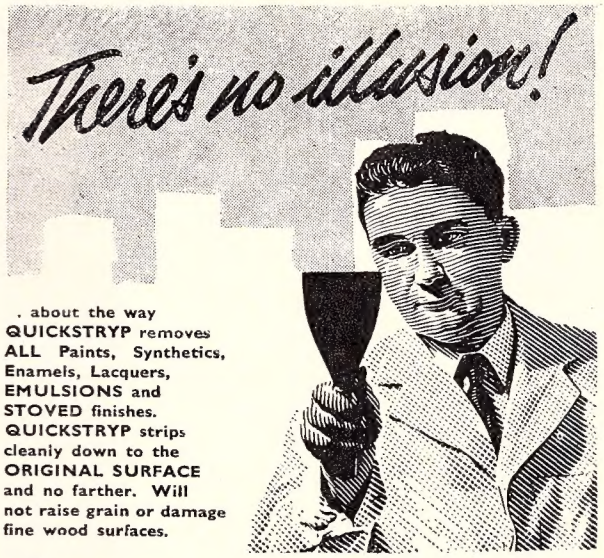

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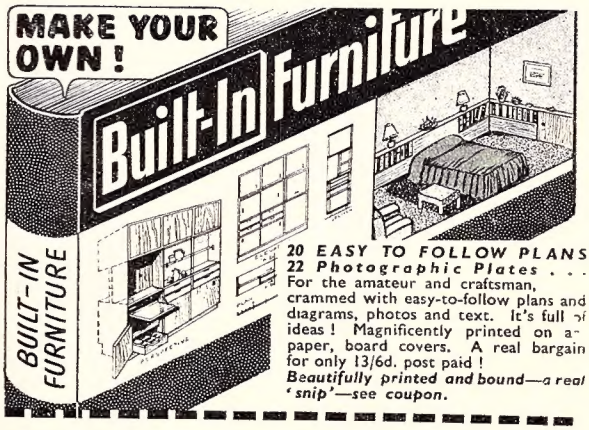

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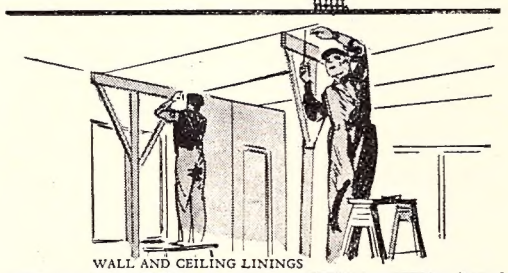

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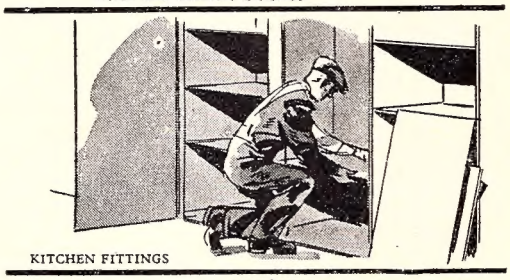

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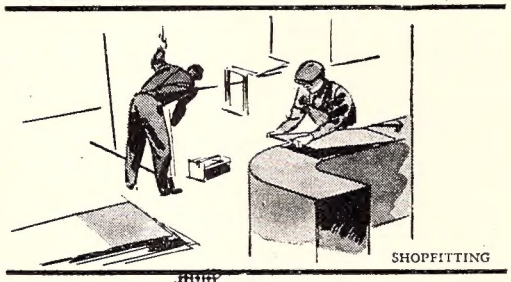

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Vol. 60 No. 747

WOODWORKER

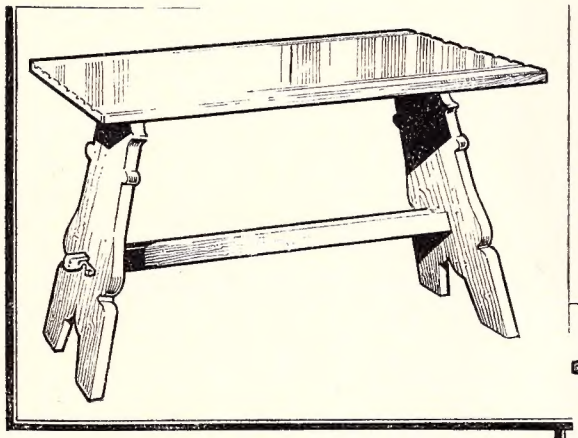
FEBRUARY, 1956

ON TRADITIONAL LINES

OAK COFFEE TABLES

The modern trend is for the coffee table to be rather larger than its counterpart of a few years ago, a popular type being up to 3 ft. or more. It depends to an extent upon the size of the lounge. The two designs in Fig. 1 are on traditional lines to be made in oak or possibly chestnut. We have had several requests for items of this kind. One advantage is that they stand up to heavier usage than the lighter type in mahogany and are more easily finished. In a later article we shall be giving other designs on contemporary lines

THE reader can choose the design which suits him the better in accordance with the facilities available to him and the wood he has. Design (A) can be made entirely in flat stuff, ½ in. to ⅞ in. thick. For design (B) 1½ in. squares are needed, and a lathe is essential—or the legs will have to be specially obtained. In both cases the sizes could be varied within a little.



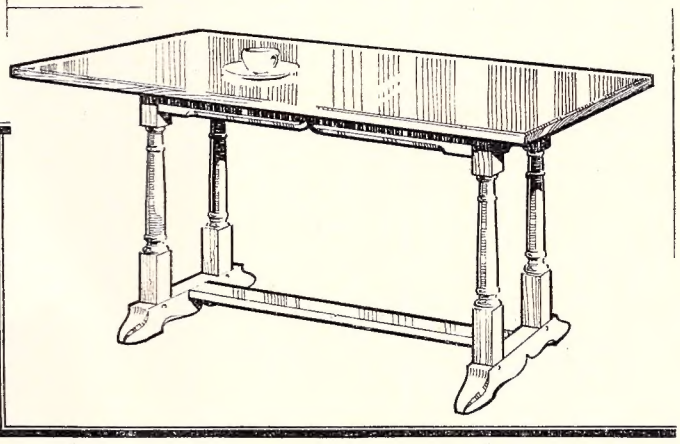


FIG. 1. OAK COFFEE TABLES DESIGNED ON TRADITIONAL LINES

Many people prefer and have asked for designs which link up with the past. Later we shall be giving further designs in present-day style

DESIGN (A)

It is advisable to set out one half of the elevation in full size, working to the sizes in Fig. 2. This will enable exact shoulder lengths to be obtained, and will give the angle required for them and for the slots and mortises in the sloping ends. Note that no attempt is made to cut the shaping at an angle. It is cut through square.

Ends.—Owing to their shape these should be cut out to finish 1 ft. 8 in. long. This allows for the slight reduction in height due to the angle at which they lean, and for bevelling top and bottom edges. Mark the notches to receive the top rails and the through mortises for the stretcher rail. Both of these are at an angle, and it is as well to set an adjustable bevel to this. If the marks are squared across the face the bevel can be used to mark the edges, so giving the line for the inner face.

Saw down the sides of the notches and cut away the waste short of the line with a coping saw, using the latter at an angle. Finally pare with a chisel up to the line. Much of the mortise waste can be bored away and the remainder partly chopped and partly pared. Remember the angle of top and bottom edges.

The shaped edges can be plotted out map fashion from the 1 in. squares shown in Fig. 2. Owing to the angularity the length will not align exactly, but the difference is small and is easily allowed for. A good plan is to mark one side on a piece of card, cut it out, and use it as a template, working to a centre line.

Use the bow saw or coping saw for the shape, and clean up with rasp and file followed by the scraper and glass-paper. The latter should be used with suitably shaped rubbers so that the corners are not dubbed over. Do not leave the edges dead sharp, but run the glasspaper over them. There are two reasons for this. A sharp edge is easily damaged, and it is almost impossible to polish a really sharp corner.

Rails.—Take the lengths from the full size drawing, and mark the shoulders with the adjustable bevel at the same angle as for the ends. The width of the bridle joints should be taken from the wood of the ends themselves. They should be a nice hand tight fit because no glue is used when assembling. Cut the wedge holes in the

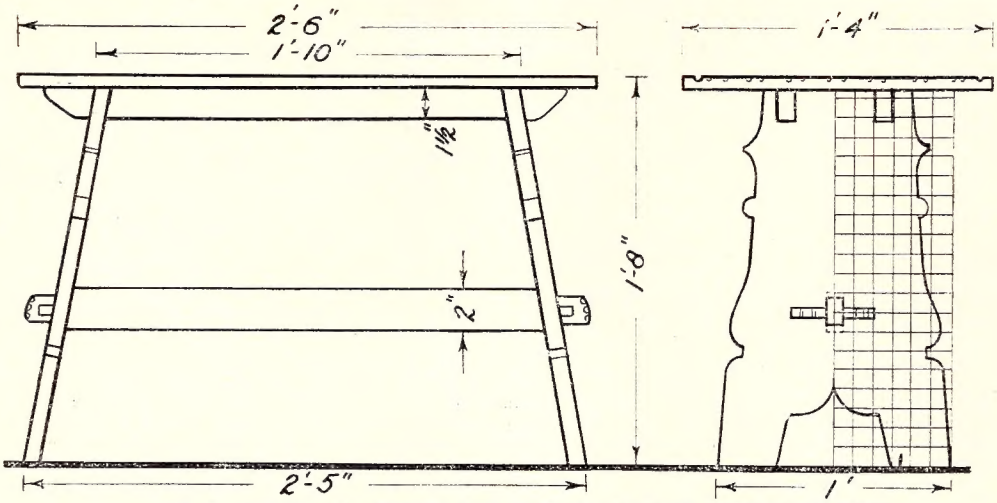


FIG. 2. DESIGN (A). FRONT AND SIDE ELEVATIONS WITH MAIN SIZES

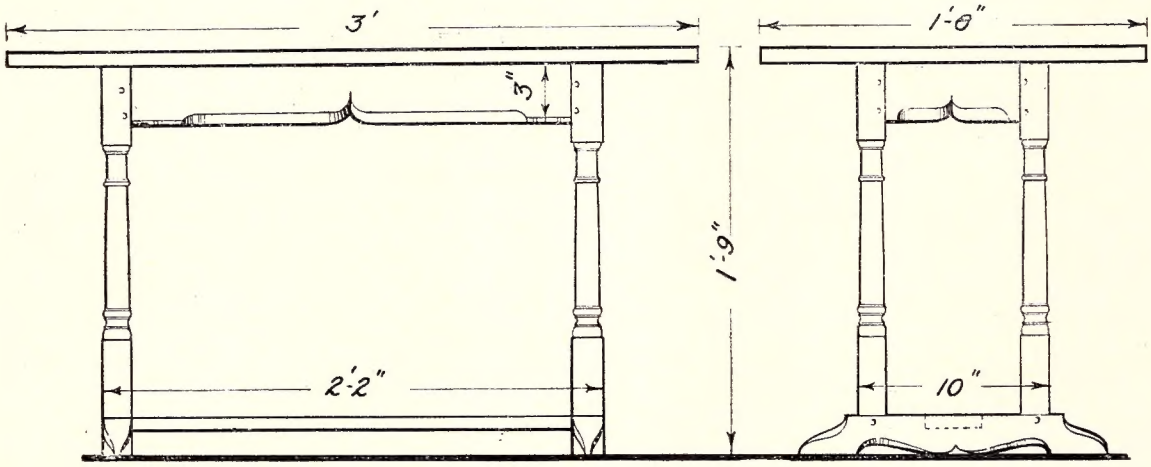


FIG. 3. DESIGN (B). DIMENSIONED ELEVATIONS

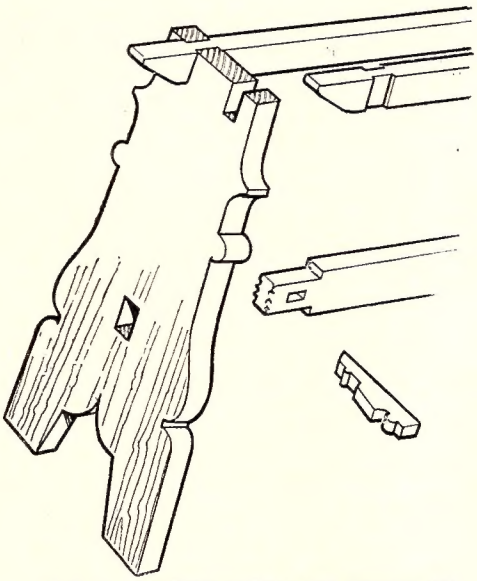


FIG. 4. CONSTRUCTION OF DESIGN (A)

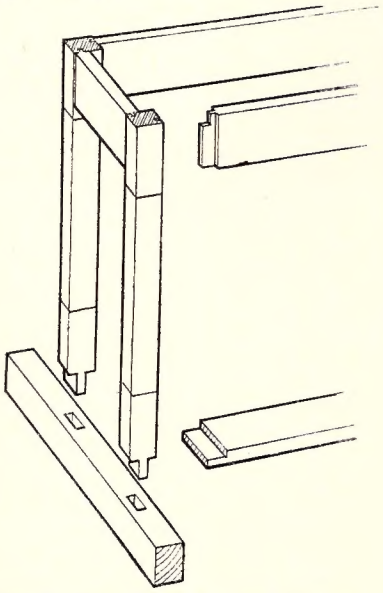


FIG. 5. HOW DESIGN (B) IS MADE

stretchers so that the wedges bear against the ends and so pull the shoulders tightly home.

Top.—Cut to size and work the quarter round hollows along near the edges. Either a small round plane or the scratch stock can be used. If preferred they could be omitted—they are entirely decorative. The notching at the ends can be done with a small gouge. Fix with screws driven upwards through the rails.

DESIGN (B)

The ends are framed up in their entirety first as shown in Fig. 5. Tenon the top rail into the legs, and mortise the foot pieces to receive tenons at the bottom ends of the legs. The mortises at the top meet in the thickness of the wood. Do not work the shaping or chamfers until after joints have been cut and fitted.

Feet.—The shaping of these can be bow sawn, or, if preferred, the wasting-away method can be used. Many prefer this when the wood is thick. A series of saw cuts is made across the grain, and the waste chopped out with chisel and gouge. Use the rasp and file to bring down to the line, and finish with scraper and glasspaper.

All the joints are pegged, and it saves the use of cramps if they are draw-bored. Fit all the joints independently, try the whole together, and test for squareness and freedom from winding. Bore the holes through the pieces with the mortises, push the joints tightly home, and mark the tenons by inserting the bit in the holes. Bore the holes through the tenons slightly nearer the shoulders.

CUTTING LIST

	Long ft.	Long in.	Wide in.	Thick in.
Design (A)				
1 Top	2	6½	16¼	½ or ⅝
2 Ends	1	8½	12¼	¾ or ⅞
2 Rails	2	3½	1¾	⅞
1 Stretcher ..	2	6	2¼	⅞
Design (B)				
1 Top	3	0½	20¼	¾ or ⅞
4 Legs	1	8	—	1½ or 1⅜ square finished
2 Rails	2	1	3¼	⅞
2 Ditto		9	3¼	⅞
2 Feet	1	4½	2¼	1½
1 Stretcher ..	2	1	3¼	⅝ or ¾

All parts are now cleaned up finally and the whole assembled. If the ends of the pegs are slightly tapered they will enter the staggered holes easily and pull the joints tightly home. Those who prefer can leave the pegs projecting slightly, in which case they are neatly rounded over. Alternatively they can be planed flush. In any case the ends are put together independently, and the side rails and stretchers added after the glue has set.

The top is fixed with pocket screws driven through the rails, the holes being generous in size to allow for possible movement.

Finish.—The tables can be finished in various ways. Those who prefer natural wood can give a few coats of white or transparent french polish and finish with wax. The french polish builds up a preliminary shine and helps to keep out dirt. For a dark finish either one of the proprietary stains can be used, or one made from Vandyke crystals dissolved in warm water with a little ammonia added immediately before use. The finish is then as before. Note that the french polish is essential when wax polish is used after an oil stain as otherwise the wax polish may lift the stain unevenly in patches. Yet another plan is to fume the table. The advantages are a fine colour and entire freedom from any rising of the grain such as that often caused by water stain.

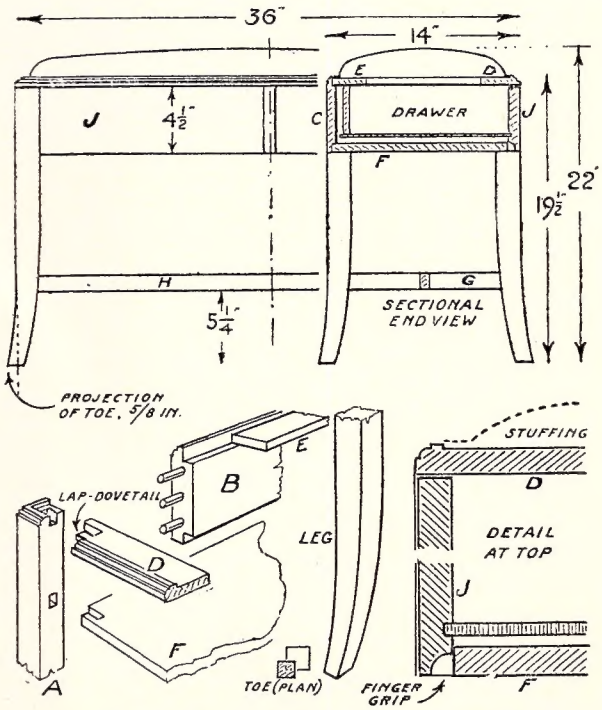
If an antique effect is desired add some lamp black powder to the wax polish whilst the latter is molten. This leaves a dark deposit in the grain and in corners, etc. (162)

DUET MUSIC STOOL

SEVERAL readers have asked for a design for this. Normal dimensions are 36 in. by 14 in. over legs at top. Height average is from 21 in. to 22 in. from floor to top of pin-cushion stuffing. Legs (A) should be, say, 1⅞ in. square. If without splayed toes they may be tapered to 1¼ in. square at foot. If shaped they can be cut from squares of 2 in., the projection of toe being ⅝ in. From cardboard or thin ply cut out the shape of the leg and work to this.

End rails (B) and back rail (C), 5¼ in. wide by ⅞ in., may be either tenoned or dowelled to legs. They are rebated for stuffing rails (E) and for bottom (F), the rails serving also as drawer kickers. The front top rail (D) is lap-dovetailed to legs and shallow-rebated for the finish of the stuffing. Size may be 2½ in. by ¾ in. It is shown moulded, but the top edge might be simply rounded. The mould (if preferred) is carried round legs, ends, and back. Bottom (F), of ⅝ in. ply or blockboard, is rebated to ends and back and provided with short tenons to enter legs. A drawer division, ⅞ in., may be dovetail-housed to back and screwed to bottom. End underframe rails (G) and stretcher (H) are 1¼ in. by ⅞ in., the rails tenoned to legs and the stretcher lap-dovetailed to rails.

Drawer fronts (J) are approximately 4½ in. by ⅞ in. Note that they overhang the carcase bottom (F), finger grips being hollowed on under edge. The drawer sides, lap-dovetailed to front and through-dovetailed to back, are stepped up to run on the bottom (F). Instead of fitting drawers the fronts (J) might in a simple way be hinged to the bottom as "falls," each being provided with a knob and ball catch. (166)



ELEVATIONS AND CONSTRUCTION DETAILS

CHIPS FROM THE CHISEL

THE GOLDEN AGE

"The small home does not need magnificence but like every place wherein a man tarries it responds most lovingly to the touch of imaginative beauty."

ANYONE who wants to realise for himself the sheer magnificence of British craftmanship in its golden age should try to visit the Winter Exhibition at the Royal Academy where a representative selection of 18th-century English furniture, silver, porcelain, and tapestries is being shown. Some of it comes from the few great houses still remaining: some outstanding pieces have been loaned by Her Majesty the Queen from Buckingham Palace: all of it is a timely reminder of what men once have done to create beauty in the world of their day, and what still could be. Never again perhaps in quite the same way: the background has changed. Many of the great houses of the past have been pulled down or dynamited because no one could be found to live in them: the rich and cultured governing class with the leisure and taste to foster the work of artists and craftsmen has passed into the shadows and the new world has become predominantly the world of little houses and little men. It has also become a world where more men than ever before have enough for good living and the little houses offer reasonable comfort. The one thing missing in the exhibition is a glimpse of what lay behind the quiet facades of the little houses of the 18th century. One sees them still here and there in country towns and villages, small Georgian houses with a withdrawn, decorous air and a modest beauty in their proportions. One might hazard the guess that here, too, in their day would be found good craftsmanship within, for the general standard was high and not confined to specialists. It flowered indeed into magnificence for the rich patron but he was often able to make use of local talent as a matter of course.

MAHOGANY LIBRARY WRITING TABLE BY WILLIAM KENT

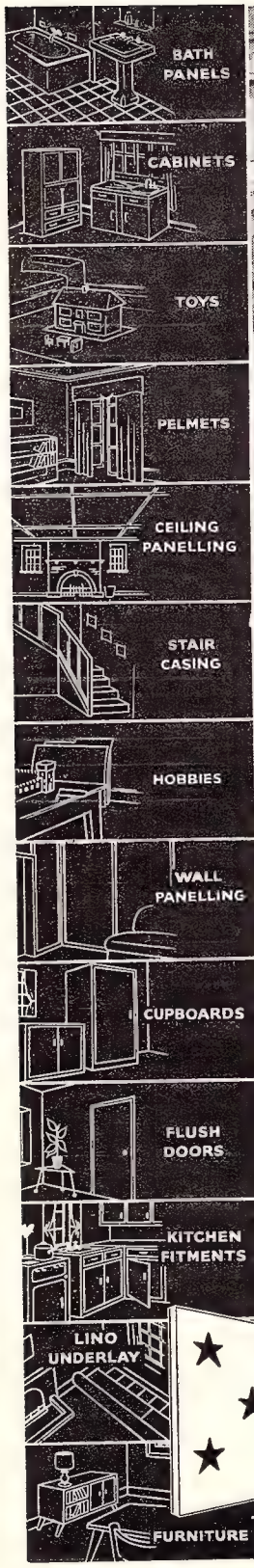
This is one of the items to be seen at the Exhibition of English Taste in the Eighteenth Century mentioned on this page. It dates from about 1735 and is one of the more restrained examples of Kent's work. It is a fine piece of craftsmanship with convex ends upon which are elliptical moulds. The compound curvature has a curious appearance when viewed from some directions. The ornaments are of gilt brass

Photograph by permission of The Trustees of the Chatsworth Settlement

* * * *

The sheer zestful exuberance of the designs of the earlier baroque and rococo periods and the manner in which the craftsmen solved the technical problems these raised with the apparently effortless ease of consummate skill make a wonderfully stimulating study for the woodworker today. We, who two centuries after are left with the meagre, spiritless, box-like furniture of present-day design may well ask ourselves if this is really the best we can produce. It is understandably the kind of thing manufacturers of machine-made furniture want to produce, being admirably fitted for that purpose, but for those of u who can use our hands, and there are an increasing number to be found, surely we can evolve a richer, lustier type of design that will have adventure in it and imagination and call out every ounce of our skill, and then more. The 18th-century designers sought their inspiration the world over, in Italy, France, China, harking back to medieval abbeys for ideas for the Gothic furniture so beloved of Horace Walpole, further back still to antiquity for the neo-classic style made famous by Robert Adams and his contemporaries, and in which Thomas Chippendale worked with such distinction. Much beauty was produced and not a few absurdities, as will happen when men let their enthusiasms run away with them, but the adventure of it, the eagerness to experiment meant a constant enrichment of the craftsmen's knowledge and skill until the Industrial cataclysm in the late 19th century put an end to all that. Today life moves at a swifter pace and our industrialised world knows far less tranquility. It can be argued that we no longer have the mental climate in which the imagination can expand with a verve and impetus which will find expression in rich and beautiful handwork. But what a mournful confession of failure that would be, to acknowledge the machine as our master, cramping and confining and defrauding us of the creative gift which lies in our finger-tips and casting away our birthright in exchange for the mechanical pleasures which are offered us today. The answer, and the only answer for men who feel within them the instinct of craftsmanship, is to make our own mental climate and nourish the imagination with the riches of art and culture, now so readily accessible, till they mean something in our lives and we ache to give them expression: to study the lives

(*Continued on page 29*)



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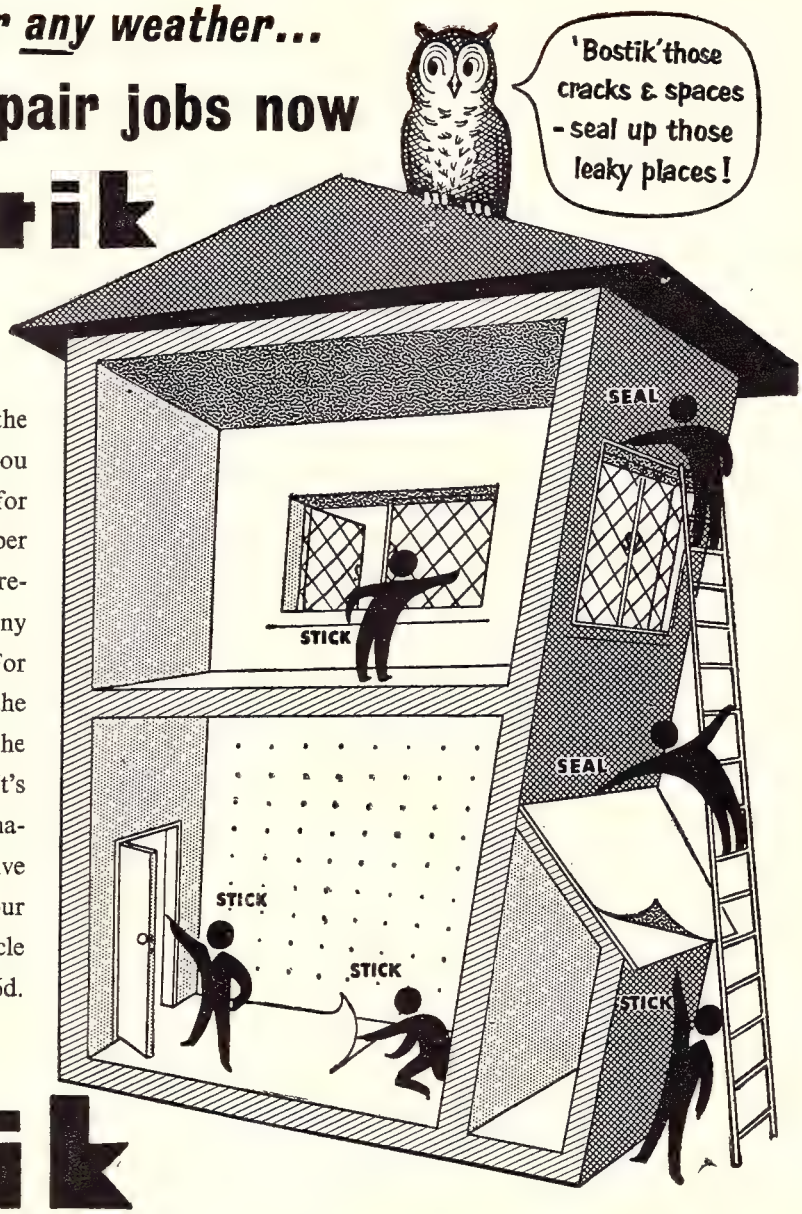

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YOUR TOOLS

By F. PAIN

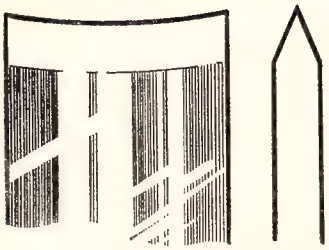

FIG. 1. BODGER'S CHISEL
Ground to a hollow shape to give a longer cutting edge

NOT many wood turners to-day would include beetles in their stock of tools, yet the pole lathe turners in Hampden woods around the furniture trade town of High Wycombe always used one. The advantage of splitting your wood is that it is straight in the grain and therefore strong, so sometimes it may be useful to remember that you *can* split some woods.

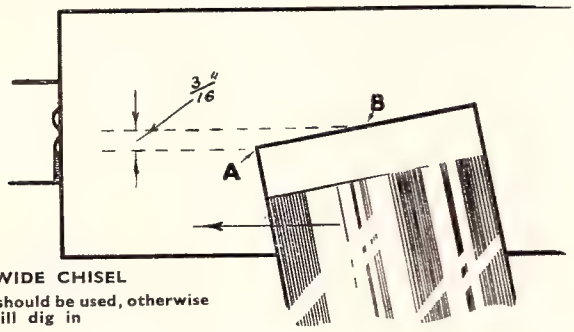

FIG. 2. WIDE CHISEL
Half the width only should be used, otherwise it will dig in

The Bodger's Chisel.—You will notice the wide chisel shown in Fig. 1. He grinds it to a hollow curve as this gives it a longer cutting edge on curved work such as the bulbous part on a leg or on the underframing of chairs. The shavings he removes are 2 in. or so wide, and, when you consider that his power is only his own foot pulling on a piece of string down tied to the branch of a tree above, it is not bad going.

Now I don't advise you to grind your chisel so, except as an experiment, as it causes it to dig in more easily, but if you are going to use a Bodger's lathe (which is another name for a pole lathe) you will find it an advantage because of its slow speed of five revolutions for one push of the treadle. He has told me it is lovely in the woods at 4 a.m., but as he is happily married I should have thought the second line of "It's nice to get up in the morning" would have applied.

Wide Chisels.—Now I like wide chisels, 2 in. or more across, but they are expensive and not to be found in many tool shops. So let us have a few thoughts on wide chisels (thinking is not harmful, although some seem to manage without it). As I'm often at Exhibitions I bring mine out. It is 2 in. wide and 20 in. long, including its split handle, and I swank by taking off shavings, and have been photographed with shavings right across the stand. If any of my former workmen were around, however, I would not do it as it is so simple to use. One man at the works brought off a shaving 50 ft. long.

I will try to show you why a 2 in. chisel is useful to have, and why, although it is all yours, you must use only half its width (A to B) in Fig. 2. Please don't take my word for it, but try it and see what happens. You can, of course, turn it over and use the other part or chisel to the right, but the sketch shows the tool moving to the left.

So we have an inch of cutting edge at an angle, and the shaving can come off anywhere in that inch. This position is maintained by keeping the tool at the same projection from the rest, letting the meaty part of the hand rub the rest as we slide the tool along. Manufacturers of lathes please note that our rests must be suitable for us to slide our hands along. Fancy shapes, lumps, etc., are an abomination to us. I'm aware that some shapes are all right, but the trade prefers just a plain parallel section.

You may understand the point I am trying to explain better if you realise that this 1 in. of cutting edge has only $\frac{3}{16}$ in. play forward or backward before you are in trouble. The dotted lines in Fig. 2 help to explain the point. You have to maintain this

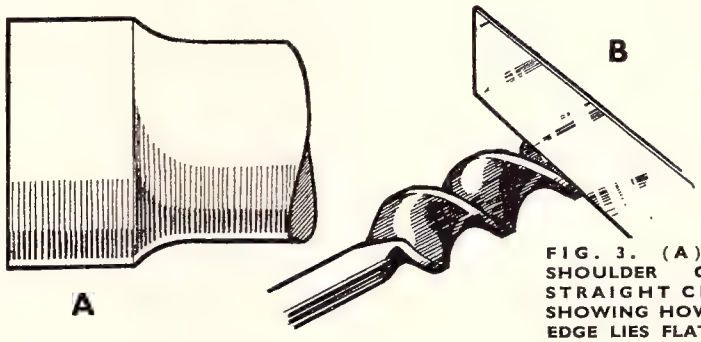

FIG. 3. (A) CURVED SHOULDER CUT WITH STRAIGHT CHISEL. (B) SHOWING HOW STRAIGHT-EDGE LIES FLAT ON TWIST BIT

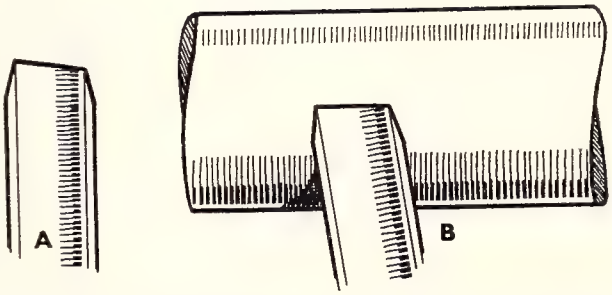

FIG. 4. GOUGE GROUND AT ANGLE FOR ROUGHING OUT

FIG. 5. GOUGE GROUND SQUARE ACROSS FOR ROUGHING OUT, ETC.

position of the tool against the cut, as of course the wood tends to force the tool towards you. You can increase the safe distance by twisting the tool to a greater angle as seen from above, but it does not give so clean a cut.

Straight Lines on Curves.—It is an interesting point (although of no value) that the wood is of curved shape where being turned although the chisel is straight, as in Fig. 3 (A). The greater the angle at which it is held the more the wood is curved. A straight edge will touch the entire curve of a Jennings bit if held across it at an angle as shown in Fig. 3 (B). Thus we have the curious feature that a straight edge can form a curve. However, all this is getting hypothetical rather than practical.

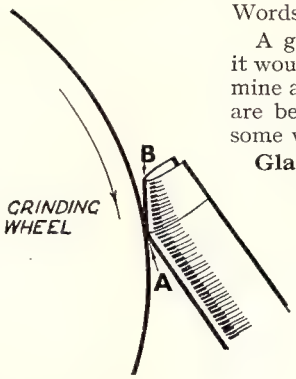

FIG. 6. GRINDING A GOUGE

You will realise that a narrow chisel has to be kept more in the correct place than a wide one, and that is why the latter is easier to use; also, being heavier, it damps out vibration and is easier to hold too. Everything is in its favour except the price, availability, and that they need room to work on, but they are worth having if you are serious.

Some books advise you to use a plane to turn with. Well, the principle is all right, but I see no advantage, and have never used one. Barbers use a cut-throat razor for their enjoyment, whereas we use safety razors and mowing machines, so let's be professional and use the naked blade of steel, and get a lovely clean cut.

Shoulders.—Now if you have to chisel up to a shoulder you just push the tool forward and this removes the little curve and leaves a sharp corner. The bevel of the tool must rest on the work, and this prevents you from starting at the very end.

You may have such a curly grained piece of wood that the chisel just splinters up the wood in the same way that a hand plane will. A gouge may solve your difficulty. This cuts through the fibres of the wood in a different way from a chisel, and you will better see this point if you cut a curve as in Fig. 3 (A) with the chisel and then cut one with the gouge. The chisel tends to lift the fibres whereas a gouge cuts through them. Try it for yourself. Words are not so good as actions to find out what happens.

A gouge would scarcely be suitable to shave with as it would cause grooves in the face, and fibres stand up on mine anyhow. So our gouge will leave grooves, but these are better than pieces being splintered out on troublesome wood.

Glasspaper.—We use glasspaper to finish off. At the works we used garnet paper from a sanding machine. Wood carvers in my younger days used shark's skin, and my blind wood turning friend finds steel wool suitable for him. We did a lot of twisting at my works and to smooth that we used glass cloth. It occurs to me that if your hands are tender you might find something at the back of glasspaper helpful; a piece of thin leather perhaps.

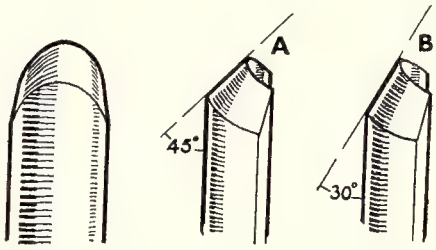

FIG. 7. POINTED GOUGES FOR HOLLOW WORK

Large Gouge.—A $\frac{3}{4}$ in. half-round gouge is ideal to rough work out with, but it is not easy to find and is hard to make. I used one a bit larger at the works for chair legs, $1\frac{1}{4}$ in., because it left the wood quite smooth enough for the twisting machine without using a chisel. It only took three times along to round a square (the price of a finished twisted Jacobean leg was one penny three farthings between the wars).

Now the back legs of chairs are springy to turn until the steady can be used and a $\frac{3}{8}$ in. gouge is often used to turn the place for the steady to run in. Two of my men ground their gouges for roughing out at an angle as in Fig. 4. It worked all right when the handle was held at an angle, too, as seen from above, and made the gouge cut in front of you more. So if you see gouges so ground it probably suits someone, though I prefer them ground square across for roughing work out with. Any part of the gouge can be used by twisting the handle, and this will guide the shavings away from you a bit. If you move the handle end the way you wish the gouge to slide it will go along itself a bit. Wood turning is so easy when you

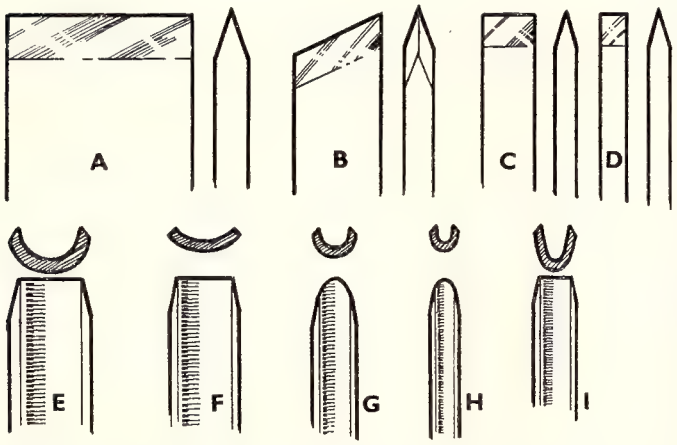

FIG. 8. SUITABLE KIT OF CHISELS AND GOUGES FOR GENERAL USE

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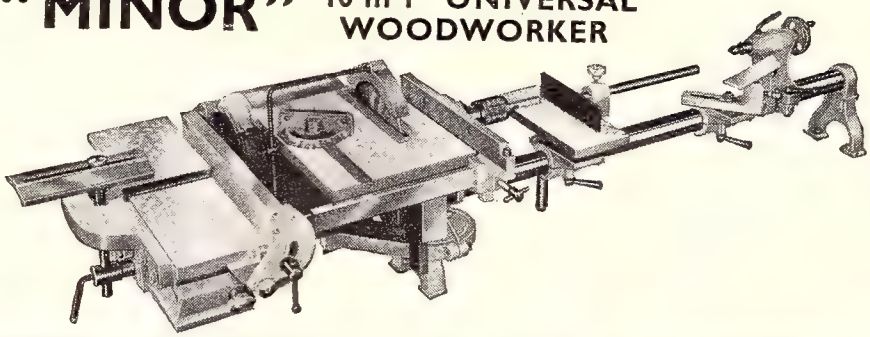
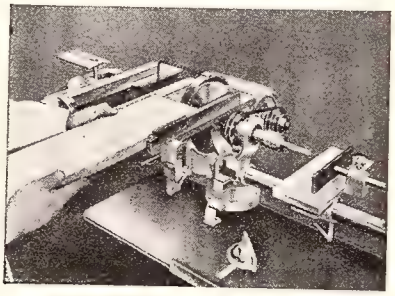
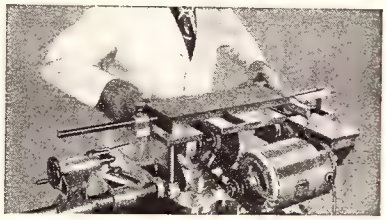


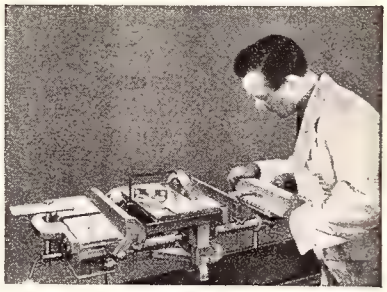
THE LATHE—SHOWING THREE USEFUL MACHINES READY FOR USE, ANY ONE OF WHICH MAY BE OPERATED **WITHOUT** DISMANTLING THE OTHERS



TILTING SAW TABLE—7" dia. Circular Saw giving 2¼" cut. Mortiser & Planer ready for use



THE COMBINATION TABLE—being used for Panel Cutting. Very useful for repetition work



THE COMBINATION TABLE—Working in conjunction with Slot Mortising Chuck. Mortises from ¼" to ⅝".

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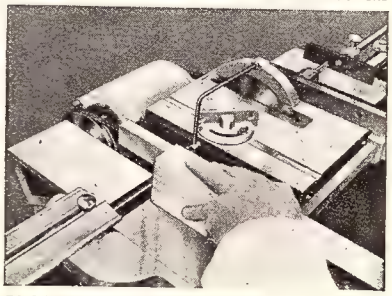
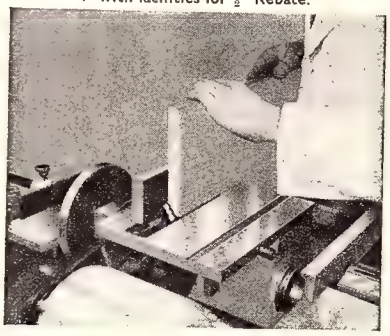
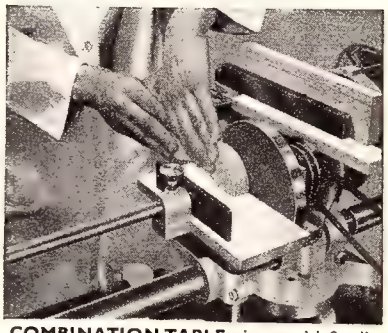


PLANING & REBATING MACHINE—Blade 4" with facilities for ½" Rebate.



SPINDLE MOULDER—The cutter block taking the place of the Circular Saw. A wide selection of cutters available.



COMBINATION TABLE—in use with Sanding Disc. This table has many uses.

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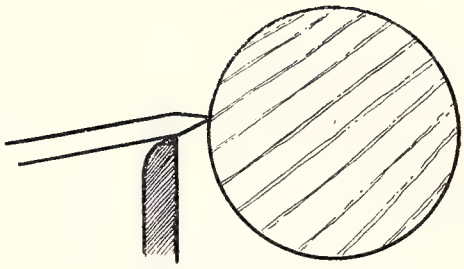

FIG. 9. CHISEL USED WITH SCRAPING ACTION
The life of the cutting edge is short

know how; the tools move themselves about. We don't use force to push the tools about, but rather present the tool to the work at such an angle that you can dig in so much and yet be prevented from going in too far by the bevel.

Grinding Gouges for Roughing.—I've mentioned it before that the bevel must rub the wood when turning, and now we will see how to grind a gouge for roughing out or for rounding squares as opposed to doing hollows. Fig. 5 shows how it is ground square across. Why grind it so? Well you have a greater length of cutting edge to work with and you can use any part of it. Also you can deflect shavings into people's faces or away from you. And if on its side it will right up to a square part such as a pummel.

Now a gouge ground to a point will not do this. To grind it I stand firmly with the handle against my side and rotate it on the wheel, my left hand just steadying it near the wheel. My right hand rotates it, and to start I let the wheel grind it at (A) in Fig. 6. In this way I don't jab the actual cutting edge (B) and so spoil it. In fact I might not even grind quite up to the cutting edge as this would cause a burr, which would need oilstoning to remove.

Gouges for Hollows.—Now gouges used for hollows are ground as in Fig. 7. Some like a well pointed gouge and some only a moderate one. To grind them we push the body a little forward as each side of the gouge is ground. This forces the tool a little higher on the wheel. In this way a larger bevel is formed at the sides of the gouge, but as the gouge is pointed the actual bevel is the same.

Don't get worried about getting an exact angle, but try for a true one, and in use you will feel it rubbing the work. When I visit people I first grind their tools as this is a good start. Badly ground tools are the greatest handicap in wood turning.

Now I'll try to help you understand what degree of point to give the gouge for certain jobs. Let us take one $\frac{5}{8}$ in. wide, rather shallow and used for gentle hollows such as in toes of chair legs. It nearly fits the finished job and we don't point it much. It does not have to start the hollow steeply and so does not try to run sideways and dig in.

Now we will think of a small hollow, rather deep and the gouge rather wide for it. We therefore give it more point as this will enable it to go deep. The part at the side prevents it from digging in when cutting the side of the hollow. The point of gouge does most of the work and so if it is very pointed we cut down the useful cutting part of the edge. It is possible without practice to spoil the work as it is so easy to dig in, but a more pointed gouge is easier to use.

Now balls can be turned with a gouge (as described in a previous article). It needs a gouge ground just a little pointed, but not too much so as pointing a gouge makes it cut a smaller curve, and the ball would be a series of grooves. A chisel does a ball better, but it requires more skill to use on large balls as it could easily dig in. We like gouges which are half-round in section or deeper than half-round. We don't use wide shallow gouges at all in High Wycombe.

I'm fully aware that in a nearby town they do use wide shallow gouges for gentle hollows in brush handles in wet beech which are short and held firmly between centres. This is mentioned because, say, for a floor standard with a gentle curve you might imagine that it would be ideal. So it would if the work were rigid, but a long piece of wood in the lathe will bend. So don't bother with them unless you are in the brush handle trade.

A $\frac{1}{4}$ in. long-and-strong chisel is well worth having and would be about $\frac{1}{4}$ in. square section at the end, but thicker nearer the handle. Many beads in turning are about a $\frac{1}{4}$ in. wide and the radius of $\frac{1}{4}$ in. circle is $\frac{1}{8}$ in. (correct me if I'm wrong). Our cutting edge would be

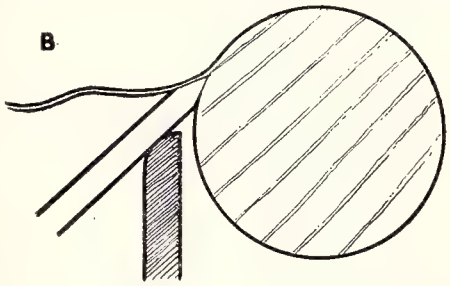

FIG. 10. CORRECT METHOD OF USING THE CHISEL
Long shavings removed resulting in a cleaner finish and the cutting edge lasting much longer

in the middle of the chisel and so be $\frac{1}{8}$ in. up, and when turned over as we do a bead would run round a $\frac{1}{4}$ in. bead without moving the handle about, only twisting it.

Range of Tools.—So it does seem to me that the right tools are a great help in mastering the art of wood turning. This is what I recommend (see Fig. 8): (A) A 2 in. chisel ground square, (B) a 1 in. oblique chisel, and (C and D) $\frac{1}{2}$ in. and $\frac{1}{4}$ in. long-and-strong chisels. In the gouges (E) a $\frac{3}{4}$ in. half-round ground square across, (F) a $\frac{5}{8}$ in. shallow gouge, (G and H) $\frac{3}{8}$ in. and $\frac{1}{4}$ in. ground to a point, and (I) a $\frac{3}{8}$ in. deep long-and-strong gouge for bowl turning. This would be a nice set of tools suitable for average work. If you do smaller work have them not quite so large. Don't think that a large kit of tools is wanted. It is rather their movement that governs the finished shape.

Scraping Tools.—Files can be ground up for face plate turning. A $\frac{1}{2}$ in. square file will make a lovely tool for large beads, one which you cannot buy. A $\frac{1}{4}$ in. one is equally good for smaller ones. You might like a parting tool which is $\frac{3}{16}$ in. thick at the cutting edge but thinner behind so that it does not bind as you part off the work. For fifty years I did not own one, however, though I now have two, both given to me. The men who worked for me did not own one either. Still, for fancy wood-ware turning it is a useful tool to have. Some of the tools mentioned are expensive, but with careful grinding will last for many years, as it is not what you grind away that counts, but what you leave.

Another thought: if you turn properly the tools keep sharp longer because the cutting edge is not presented

(*Continued on page* 29)

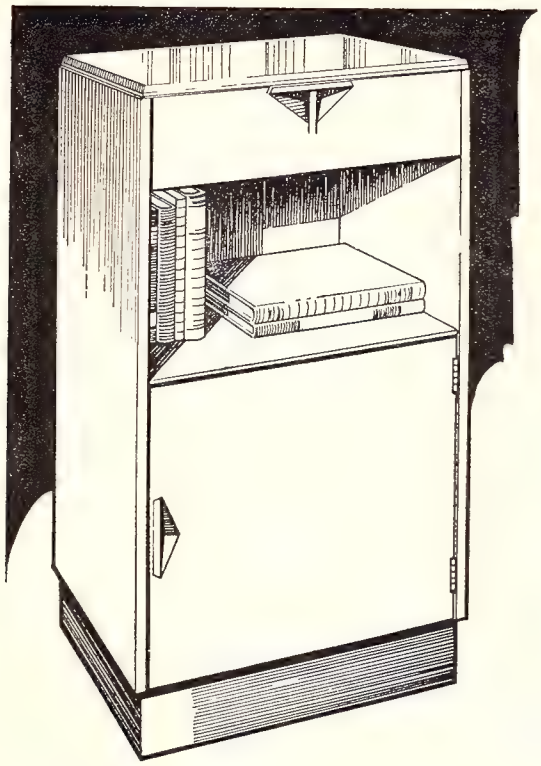

FIG. 1. ATTRACTIVE ITEM FOR THE BEDSIDE
This offers excellent accommodation. Apart from drawers, shelf, and cupboard there is ample room for a lamp and the early morning tea tray

PEDESTAL CUPBOARD

This makes a useful piece for the bedside. It could be in a light hardwood—it would in fact look well bleached—with dark plinth. Alternatively, the whole thing could be painted. Finished in one of the modern flat or egg-shell paints it would be most attractive

FOR the main carcase either $\frac{5}{8}$ in. or $\frac{3}{4}$ in. wood is used. Ends and bottom will probably have to be jointed to obtain the width of 12 in. Simple rubbed joints should be quite successful if properly made. Trim the wood to size, noting that the bottom stands in at the front by the door thickness plus the set-in. At the back it stands in level with the rebate which holds the back. The same idea applies at the top, though an economy is affected by using two rails as shown in Fig. 3. The shelf, also of the same thickness stands in at the back in line with the rebate. At front it stands in the merest trifle, but is rebated at the underside to receive the door. In this way it presents only a thin line at the front.

Top rails and bottom are lap-dovetailed to the ends (Fig. 3). The shelf fits in either a plain groove or is slot-dovetailed. In the latter case it is a help to slightly taper the dovetail because in this way it is not a close fit until pushed right home. It is a considerable help in the fitting. Assemble the parts and test for squareness.

The plinth stands in at front and sides about $\frac{3}{4}$ in. Front corners are mitred, but the back piece fits into grooves cut across the sides near the back. Put the plinth together as a whole and rub in glue blocks at the front angles. In the best way the plinth is held on with buttons, and when this is done the grooves to receive them should be worked before assembling. Failing this, pocket screwing is used. The front can be screwed rigidly, but at the back slots rather than holes should be made as this allows shrinkage to take place.

In place of the usual runners slips are screwed to the inside of the ends, and the drawer sides are grooved to fit over them. The slips are rigidly fixed at front only, slots being cut at the back to allow for possible movement. Note that the drawer front is wider than the sides since it projects upwards and stands in front of the top front rail (Fig. 2). The bottom, which is of plywood or hardboard, fits in rebates in front and sides. The back stands above it. Apart from this the drawer construction is normal, with lap-dovetails at front and through-dovetails at rear.

For the door it is advisable to use laminated board, or good quality multi-ply edged all round. Otherwise use straight-grained reliable wood which is thoroughly dry (keep it for as long as possible in the atmosphere in which it will stand) and veneer both sides. For the handle either use a plain wood bar, or cut the recess shown in Fig. 1 and glue pieces of hardwood or plastic into notches cut to receive it. The same thing applies to the drawer.

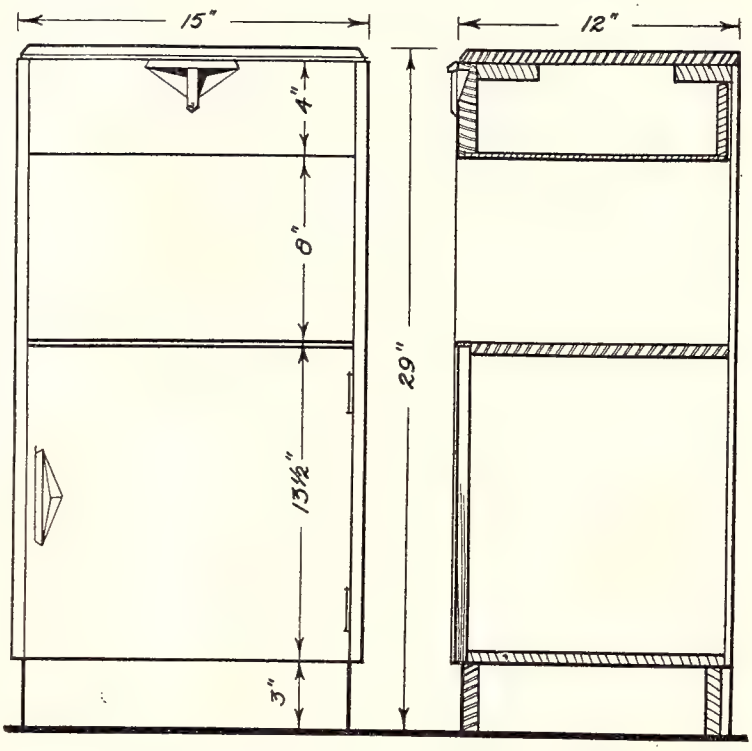

FIG. 2. FRONT ELEVATION AND SIDE SECTION

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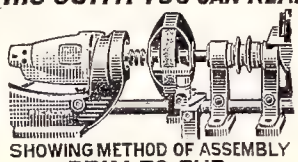

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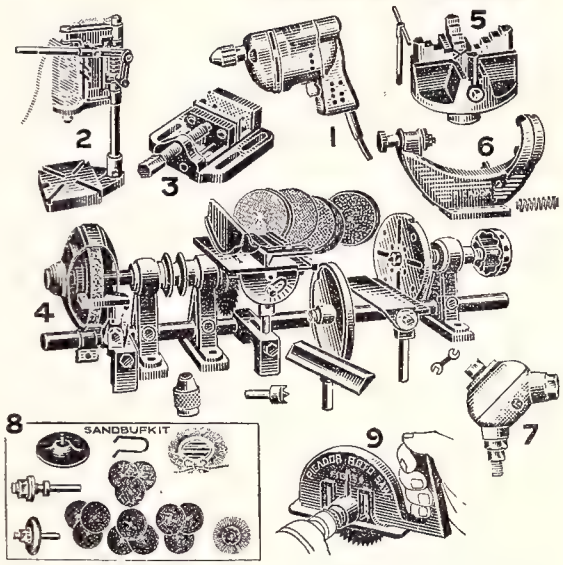

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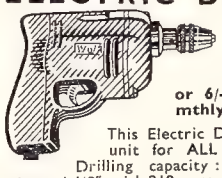

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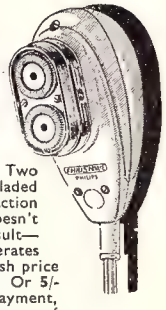

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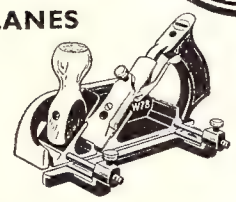

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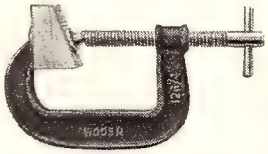

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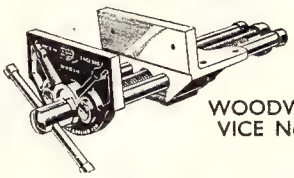

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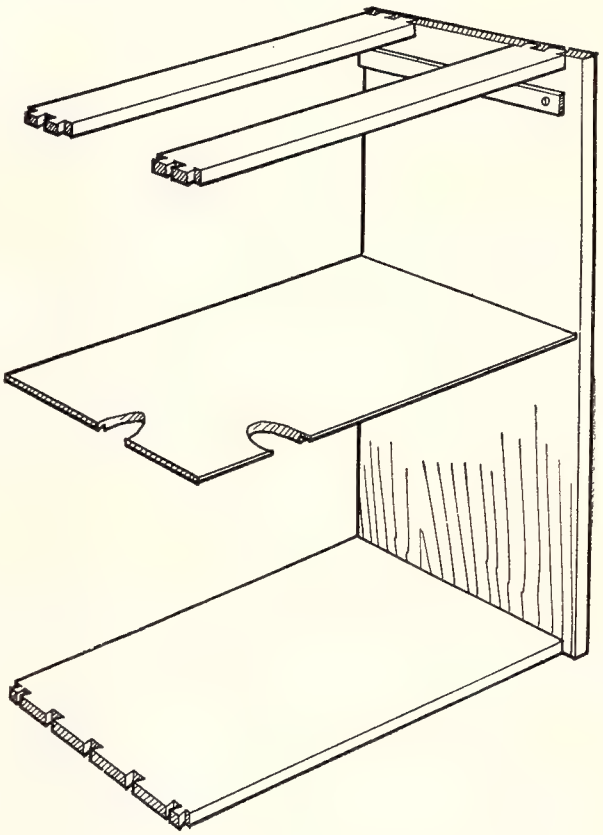

FIG. 3. HOW THE MAIN CARCASE IS MADE

CHIPS FROM THE CHISEL

(*Continued from page* 24)

of men such as William Morris who felt just such a craving and worked with the same kind of exuberance as those men of the 18th century ; and, most important of all, to study the work itself of the craftsmen who wrought so finely till we feel in our very bones the urge to follow. For this we need all the close observation and feeling we can bring to it. The poet who complained, "We have no time to stand and stare," sums up the general attitude pretty shrewdly. We are all too apt to pass things over with a casual glance, missing the infinitude of detail which makes up the sum total of beauty. We have to give ourselves time to realise the grace and skill with which difficulties have been overcome, the apparently diverse elements fused and harmonised, the detail that is lively and whimsical and full of sly fun.

* * * *

Then we have to turn our thoughts homewards, to see how we also can use and adapt the ideas which come to us from all these different sources, and can do something for the small homes which will be truly enriching. The small home does not need magnificence but like every place wherein a man tarries it responds most lovingly to the touch of imaginative beauty. To bring this into it by our own talent and skill is to fling back into the very jaws of the machine the answer of creative man and so to fulfil ourselves and light the way for others. (159)

MARKING OUT

(*Continued from page* 31)

full-size drawing of the angle required and to lay the bevel square on it while setting. If a mitre square is not available an angle of 45 degrees can be marked on a piece of wood as shown in Fig. 4 and the bevel square set to it.

Geometrical Curves.—Carpenter's compasses, which have both legs pointed, are used for circles up to about 18 in. in diameter. For larger diameters trammels, sometimes called beam compasses, can be purchased. These are separate pointers which can be attached to a wooden batten as shown in Fig. 6. Another way out of this problem is shown in Fig. 7. A light batten has a V cut in one end to retain a pencil and a series of holes are made along it to accommodate a bradawl. The bradawl acts as the centre while the pencil marks the curve.

Ellipses are marked out by the "pins and string" method as shown in Fig. 8. Major and minor axes of the ellipse, DE and AC on the sketch, are marked on the wood at right angles to each other. The compasses are then set to half the length of the major axis OD, and, with the centre of the compasses on C, the points B and F on the major axis are found by drawing arcs through this axis. Three nails are driven in at C, B, and F and a triangle of string tied tightly around them. The nail is removed from C and a pencil put in its place. By moving the pencil along while keeping the string taut you will be able to mark the outline of the required ellipse. (111)

(*To be continued*)

WOOD TURNING

(*Continued from page* 27)

to the work as in Fig. 9, in which the tool merely scrapes, but as in Fig. 10, which shows the wood rubbing one side and the shaving leaving the other.

My daughter on her way to Congo noticed men smoking sardines to cure them. Well! we have the National Health service here instead, so let the Portuguese carry on. For my part I advocate wood turning as one of the best relaxations. If not done intelligently with good tools, however, it can become just an added worry as you feel frustrated, whereas it should be a joy to do. (107)

Our contributor this month is an experienced lecturer and demonstrator, and has written a number of books on woodwork. He deals with what is obviously an extremely important part of woodwork. His article will be concluded next month

MARKING OUT. Part 1

By S. H. GLENISTER, F.Coll.H.

There is no doubt that much of the mediocre craftsmanship carried out by less experienced woodworkers is due, in some degree, to the inefficient and inaccurate methods adopted in marking out their work. Too often have I seen say, shoulder lines, which need to be cut very accurately for good results, marked out with pencils, the points of which are thick enough to cause one to be as much as 1/16th in. out of truth when cutting to them, and yet still do not belie the operator when he says, "I cut on the line." This kind of marking out is just not good enough for first-class work and so I propose to discuss the general principles which must be followed for accurate work in order to help those readers, who may be fumbling in the dark, to improve their standards and to lead them towards thinking along the right lines

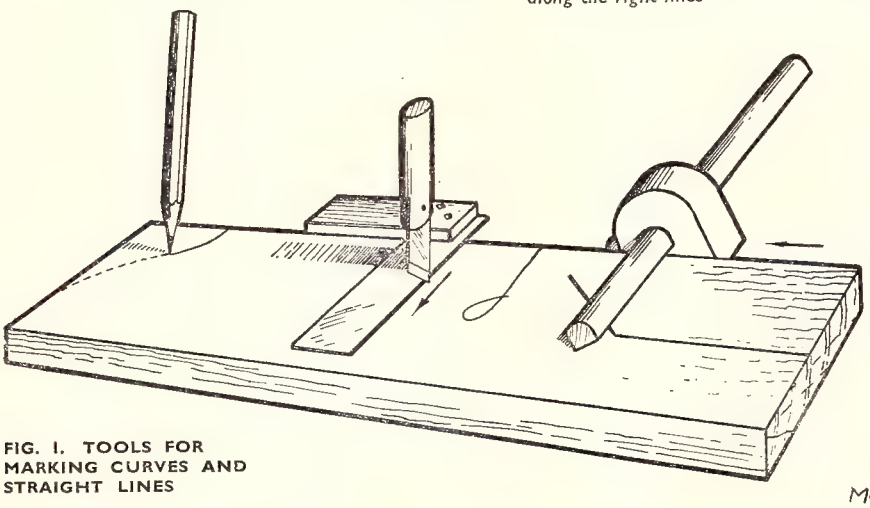

FIG. 1. TOOLS FOR MARKING CURVES AND STRAIGHT LINES

THE first principle to adopt is to use the right marking tool for the job in hand.

Marking Tools.—Fig. 1 shows the three tools in general use. A sharp pencil is used only for free curves and such guiding lines that are not to be cut to later. A pencil is used for this latter purpose to prevent scoring the wood, because scored marks might be difficult to remove later. As a general rule a pencil is used only when a scoring tool is not practicable.

For all lines *across* the grain of the wood a marking knife is used —some craftsmen use a chisel to serve this purpose. If the knife is kept sharp and is drawn towards you when marking as shown in Fig. 1 it will sever the fibres with a clean, sharp line and make an accurate guide for sawing.

The gauge is always used for parallel lines *with* the grain. A knife is useless working in the direction of the grain as it tends to follow the lines of the soft layers of wood instead of keeping straight. The fence of the gauge should always be applied to the face side or edge of the wood if accuracy is to be maintained, and it should be pushed away from you with the point trailing behind. If the fence is then kept tightly in contact with the side or edge of the wood a clean, accurate, parallel line will ensue.

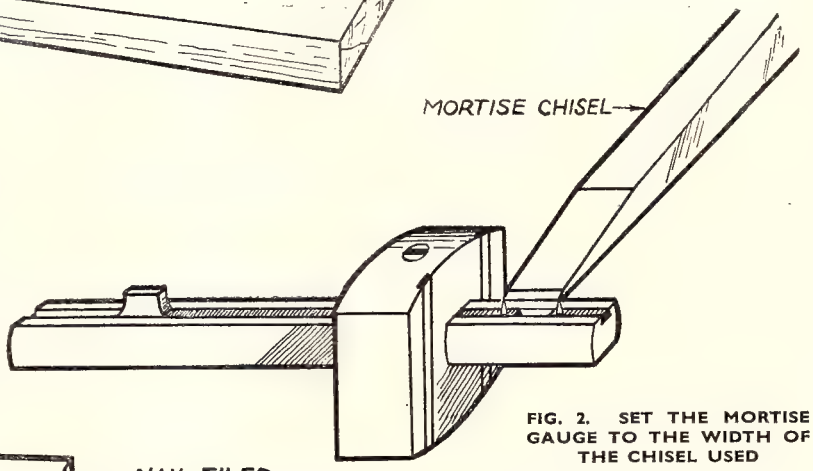

FIG. 2. SET THE MORTISE GAUGE TO THE WIDTH OF THE CHISEL USED

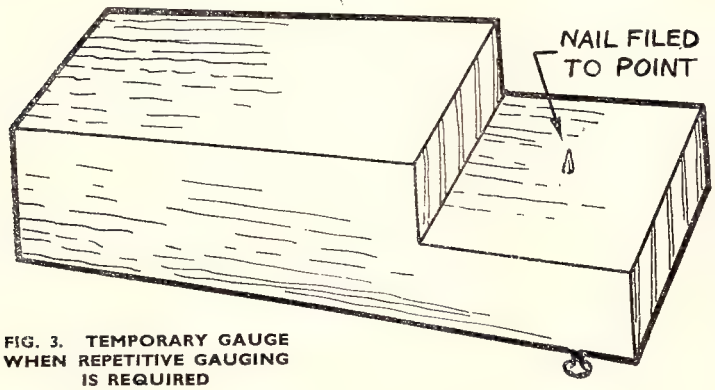

FIG. 3. TEMPORARY GAUGE WHEN REPETITIVE GAUGING IS REQUIRED

For marking out mortise and tenon joints a mortise gauge should be used as it ensures that the two parallel lines which it marks will always be the same distance apart. By the way, when preparing to gauge mortises and tenons always

If SAMSON could have tried his strength on a CASCO-glued joint...

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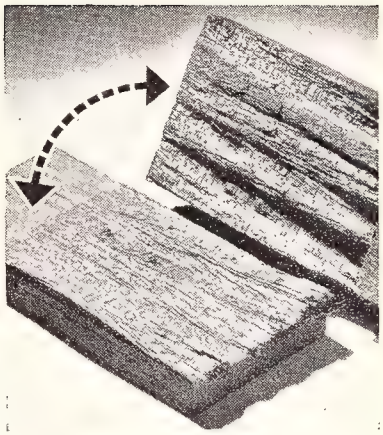

A hardwood lap joint, forcibly separated, showing how the glue has proved stronger than the wood. The joint was glued with CASCAMITE "One Shot" Resin Glue, but the same results are obtained with both CASCO P.V.A. and CASCO Cold Water Casein Glue.

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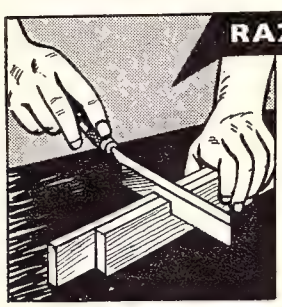

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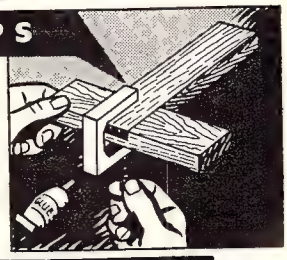

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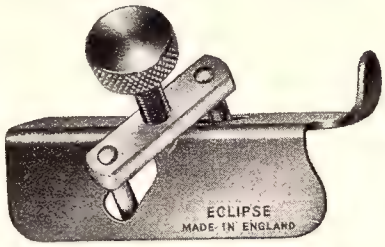

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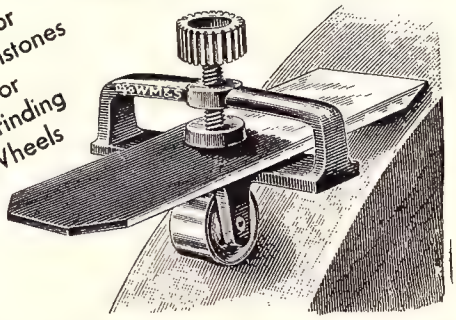

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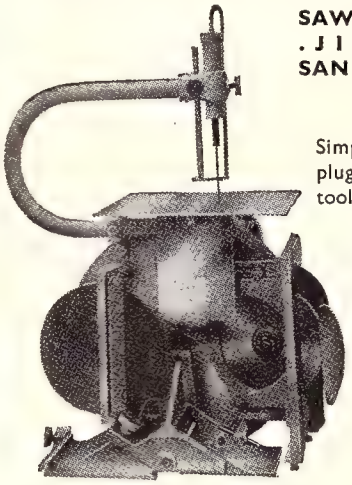

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FIG. 4 (*Right*). THE BEVEL AND MITRE SQUARES

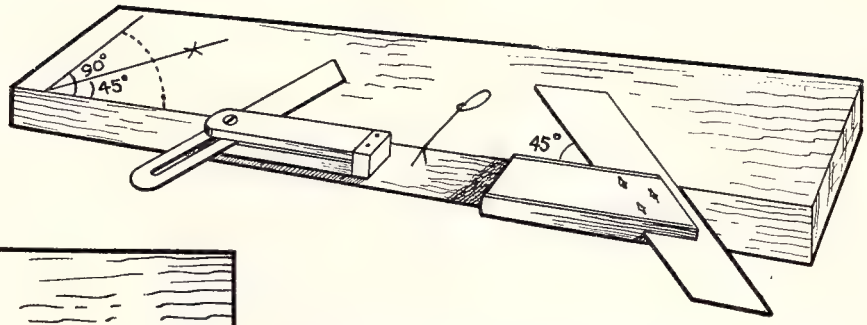
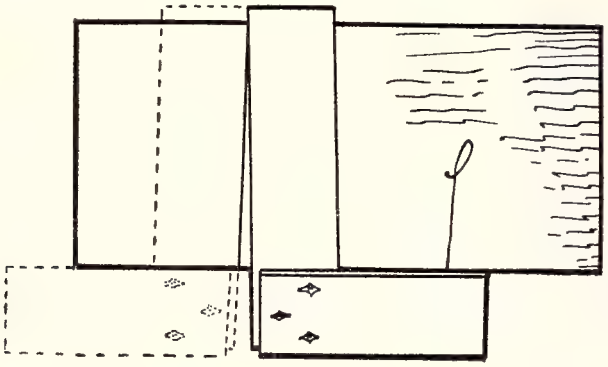


FIG. 5 (*Below*). TESTING A TRY SQUARE FOR TRUTH



their stocks must be held tightly to the *face* surfaces of the wood. Non-observance of this rule often leads to inaccurate marking out. If when squaring a line all round a piece of wood you find that the lines do not join up it is due to the fact that you have ignored this rule, and, although it may appear so, your wood is not quite parallel. This error naturally increases with the width of the wood.

To test a square for accuracy (they are not always infallible) set it against a perfectly straight edge and mark a line. Turn the square over as shown in Fig. 5 and if its edge does not coincide with the line either file the edge of the blade true or, better still, buy another square.

The mitre square is fixed at an angle of 45 degrees; the bevel square can be set to any desired angle. To set the bevel it is usually best to make a

(*Continued on page* 29)

start by setting the gauge to the chisel you will use to cut the mortises as shown in Fig. 2. This ensures that your mortises will be the same width as your tenons. It is the only way to be certain of a good fit.

Gauges are not used generally for lines across the grain because the point of the gauge tears the fibres rather than cuts them with unsightly results. About the only occasion when a gauge *is* used across the grain is when marking out dovetail shoulders. For this most craftsmen use a cutting gauge (which has a knife blade and not a pointer) in order to sever the fibres cleanly.

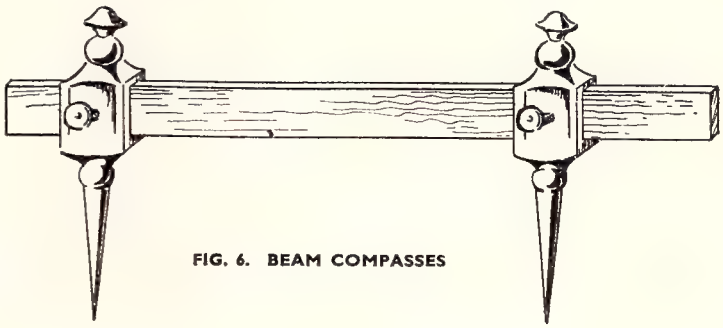


FIG. 6. BEAM COMPASSES

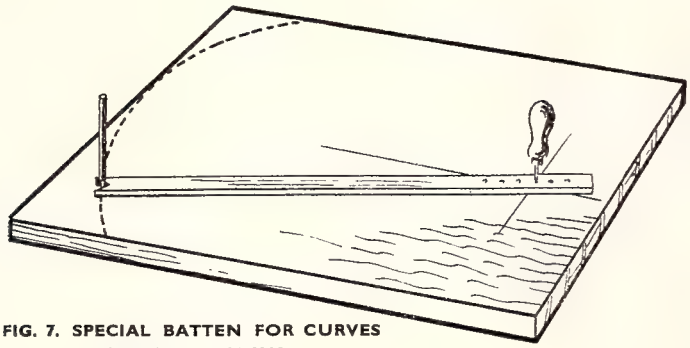


FIG. 7. SPECIAL BATTEN FOR CURVES OF LARGE RADIUS

There are times when you have much repetitive gauging to do with insufficient gauges available. On these occasions it is a simple task to make up a temporary gauge as shown in Fig. 3. This method can be adopted if you wish to mark a number of parallel lines on a surface by driving in sufficient accurately spaced nails for the number of lines required.

Guiding Tools.—The main guiding tools are the try, mitre, and bevel squares, the two latter tools being shown in Fig. 4. Whenever these tools are used to guide the knife or pencil

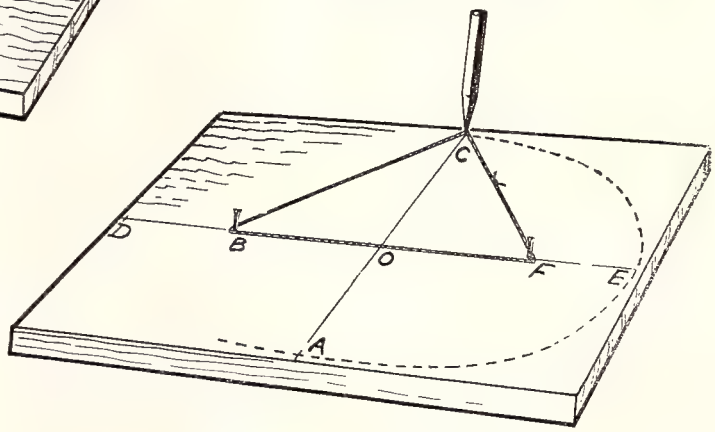


FIG. 8. DRAWING AN ELLIPSE USING PINS AND STRING

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CARVED W

These delightful trays can be put to a v and sweets or, if coated with some form Size is not important, consequently the handicraft centre where short er

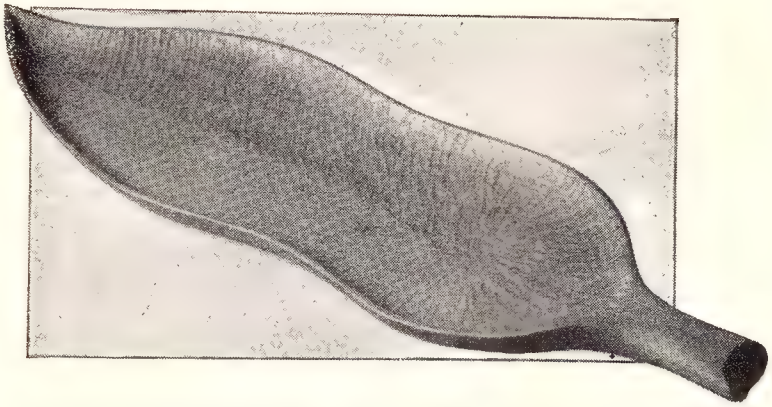

FIG. 1. HANDSOME LEAF DISH IN MANSONIA

THE only tools required for carving these dishes are $\frac{1}{4}$ in. and $\frac{3}{8}$ in. carving gouges.

Procedure.—A basic principle to follow, when making hollow ware is to work the hollow section before any external shaping is cut. This ensures that adequate areas which can be used to nail or clamp the work to the bench are provided. If it is intended to make the trays on miniature lines the wood is glued to a larger board with a piece of newspaper between. When carved the work can be easily levered off and cleaned up.

Carving the Hollow.—To prevent cutting too deeply, a simple depth gouge can be made by driving a nail through a piece of batten, allowing it to project to the depth required, Fig. 4.

Where possible gouge cuts should be made across the grain, working towards the centre from each side. The leaf dish, Fig. 1, where the gouge cuts can be clearly seen, illustrates this point. The cuts reach their full depth quite close to the outline so that the centre is approximately flat. In the initial stages the work is eased if the mallet is used. For the finish, however, use hand pressure only and keep the gouge sharp. As it is difficult to obtain a smooth finish of even depth throughout it is recommended that the gouge cuts be left as a form of decoration. If these are cut clean and crisp they will mask any slight variation in depth

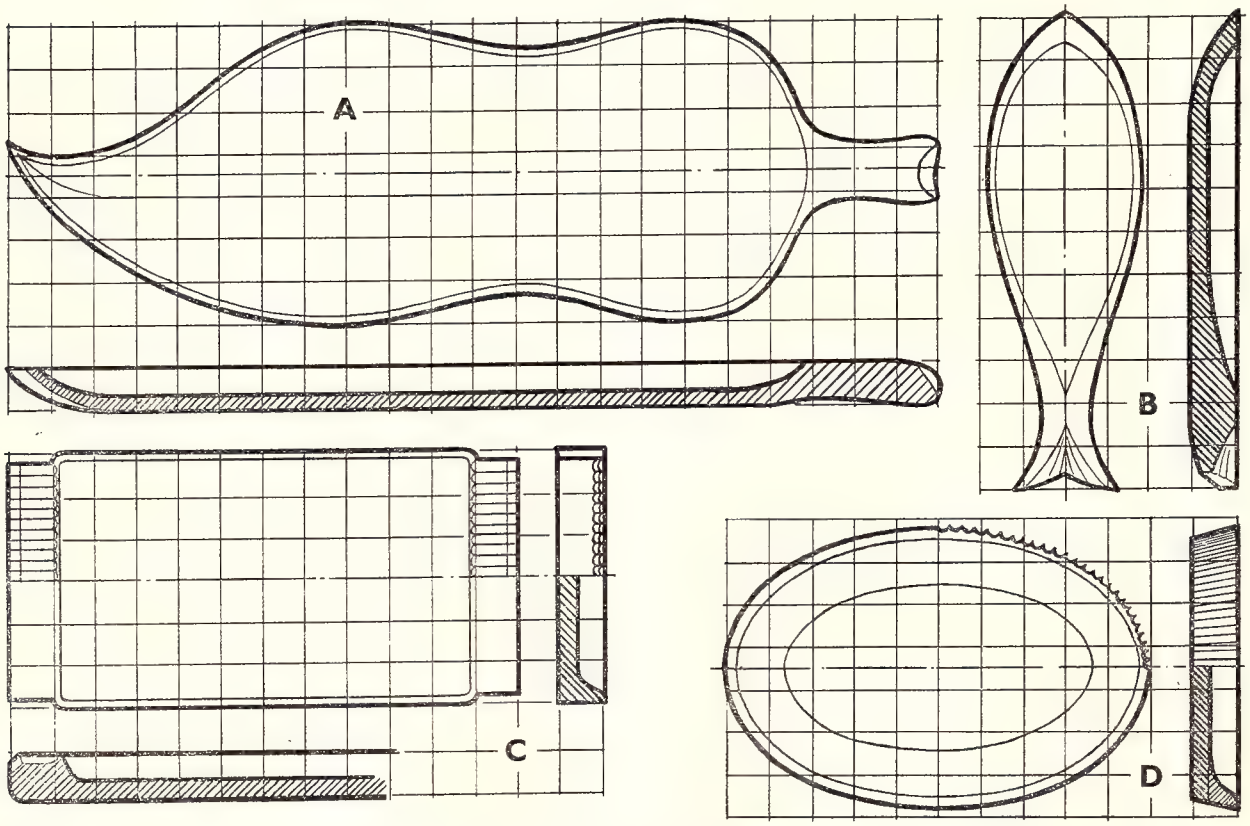

FIG. 2. OUTLINE AND SECTIONS

All the shapes are shown superimposed on 1 in. squares to enable enlargements or reductions to be made easily. The leaf design A, is shown in Fig. 1; B, C and D Fig. 3

TIVE

OOD DISHES

of uses. They could serve to hold fruit otective finish, bread, cakes, or biscuits. ld provide excellent models for a school timber are usually in abundance

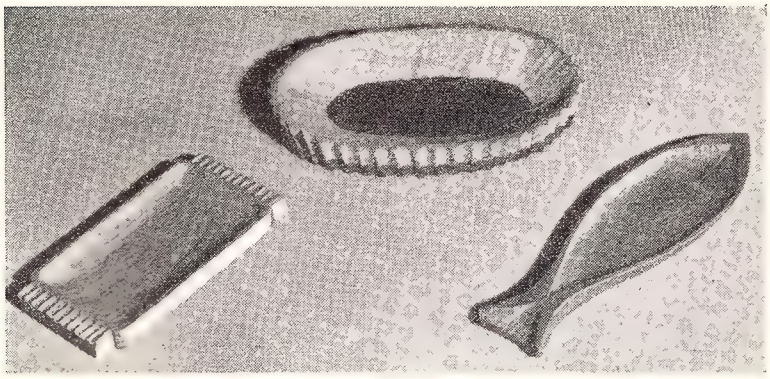

FIG. 3. DESIGNS IN MINIATURE USEFUL FOR PIN TRAYS

and, at the same time, provide a pleasing contrast to the smooth outer surfaces and edges. The outer surfaces are best cleaned up with a rasp and glasspaper, the inside with fine wire wool.

In Fig. 5 (centre) is shown an elliptical tray made from laminated timber. For this oak and mahogany are used but any close-grained contrasting coloured hardwoods would do. One distinct advantage of using laminated timber is that the colour variations provide a good method of checking the depth.

The various outlines and through sections shown in Fig. 2 are superimposed on 1-in. squares. To reproduce these, prepare the graph full size and plot the shape concerned. Enlargements or reductions can easily be made by drawing a grid containing the same number of squares to cover the over-all size required. For example, suppose a 5-in. elliptical pin tray of the type shown in Fig. 5, is required. First a graph of ½-in. squares is drawn, and on this is plotted the outline of the shape. This is transferred on to the wood to be worked with the aid of carbon paper.

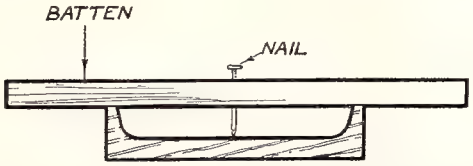

FIG. 4. DEPTH GAUGE MADE FROM BATTEN AND NAIL

It is advisable to cover the finished job with some form of protective film or the gradual accumulation of dust and finger marks will get worked into the timber with use. A good finish for trays and dishes of this kind, particularly if foodstuffs are to be placed on them, is two or three coats of french polish. Alternatively, one of the many clear synthetic varnishes could be used.

(157)

If you are interested in wood carving you will find *Wood Carving for Beginners* an extremely useful book. It contains all essential information on sharpening and using tools, and includes a number of designs in full size. With 46 pages, size 9¾ in. by 7 in., published by Evans Bros. Ltd., Montague House, Russell Square, London, W.C.1. Price 4s. 6d. net. Obtainable through any bookseller.

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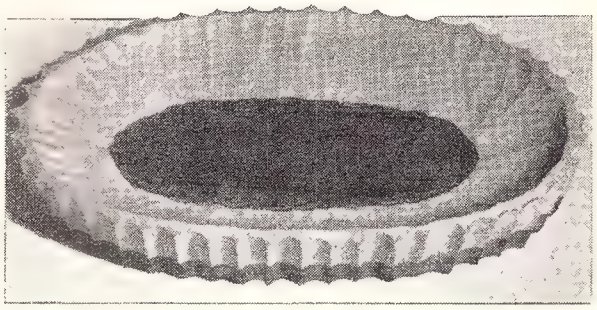


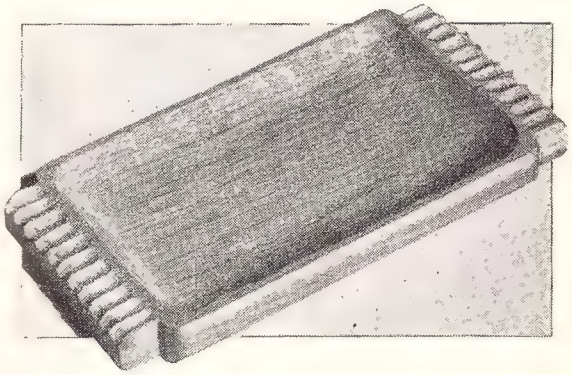


FIG. 5. Top: Fish, carved in oak. Centre: Elliptical dish with fluted sides; oak and mahogany. Bottom: Shallow oblong dish with fluted ends of oak

IN THE POLISHING SHOP

(*Continued from page* 44)

The main aim of filling is to pack the grain flush to the wood surface. Even a thin coat left on the actual surface will cause an unsightly dark patch. The filler can be made dark to pick out the figure on woods such as plain oak, Italian elm, ash, etc., or to blend with the timber colour on other woods—walnut, beech, figured oak, prima vera, obeche, ramin, etc.

Fillers are made from a base—silex, silica, whiting, etc., with agents for binding, colouring, and thinning. For those who like to have the fun of making everything up themselves a typical recipe is appended.

Do tint white filler before use. An approximate match is satisfactory.

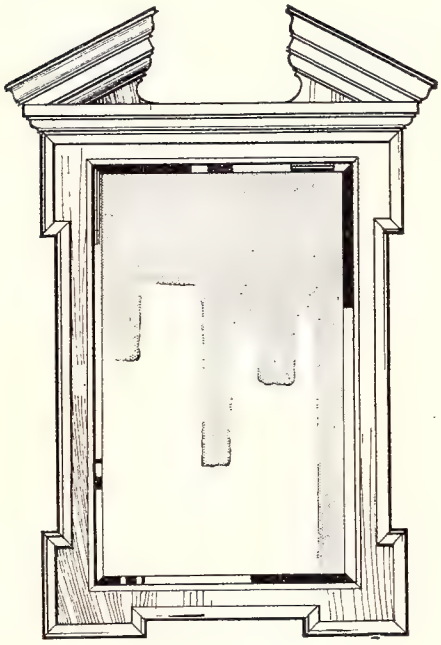
Do allow adequate hardening time for fillers.

Don't merely wash the surface with the filler. Study the technique and aims described and apply them carefully in good light.

Don't rub in the filler before it has reached the critical stage of thickening and losing its glint.

Don't proceed with the work if, after hardening, the filling is obviously inadequate. Repeat the filling process.

Don't attempt to fill an area of more than 2 or 3 sq. ft. at a time.



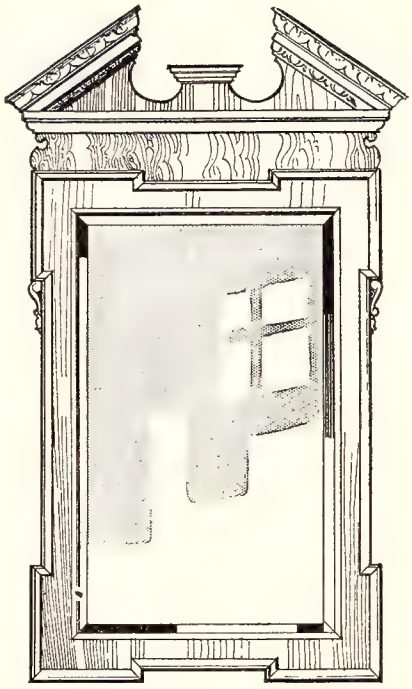
CARVED AND GILT MIRROR

About 1715

(*See measured drawing on page* 35.)

This mirror is of fine proportions and workmanship. A feature of special interest is that the flat surfaces are in polished walnut (veneered on a pine groundwork). The mouldings and detail are carved and gilt. Around the mirror is a narrow bevel. Mirrors of this kind are architectural in appearance, and, in common with all work based on the classical style, are extremely dignified and attractive.

Such a mirror would look well in a large and fairly lofty room or hall. In a small room it would probably appear too big, and we give here suggestions for two simplified smaller frames. The same general design is followed, but elaborate detail is omitted, and the smaller size makes them suitable for the average small room. The glass itself might be 20 to 24 in. high.



Plaster-of-paris is an old type filler which is still a favourite. Always mix at least 5 per cent dry earth colours with it before use. When dry it leaves dust sticking to the surface. Linseed thinned with a little turps, applied generously, rubbed well, and wiped off as dry as possible will remove this dust and make the filler invisible. Plaster-of-paris is a good filler, but you must guard against its turning white under the varnish film—a fault which can be avoided as we have described.

Technique of Application.—Apply the filler along the grain with a brush or rag. The medium will evaporate quickly and in a minute or two the filler will thicken and flatten. Now rub in, aiming at packing the pores flush and working across the grain without changing the rag. Follow up immediately by cleaning off the surplus with a fresh rag and still working across the grain. Finally clean off lightly along the grain to remove rag and finger marks.

Fillers harden by evaporation of the medium and oxidisation of the binding agent, or alternatively by setting as in the case of plaster fillings. Adequate hardening time is absolutely essential and except for special factory fillers the minimum is one day.

Do's and Don'ts :

Do fill timbers where the pores are even slightly open.

Do ensure that all surface filler is removed.

Making Paste Fillers.—Mix one part boiled linseed, one part turpentine, one-third part copal varnish, and one-third part gold size. Mix in silex (crushed transparent rock) to form a heavy paste. Thin with turpentine and colour with earth powders before use. (146)

NEW TIMBERS—

(*Continued from page* 38)

figure, the wide sapwood being of a yellow or pink tint. The texture is moderately close, the grain usually straight, and the weight extremely variable.

Due to its density this timber is rather difficult to work being much harder than, say, oak. All normal woodworking processes can be done with care, though sharp tools are essential and the dulling effect on cutting edges may be very noticeable.

This is an extremely strong wood, and while it is not highly resistant either to decay or insect attack, it is sufficiently durable for all the purposes for which it is likely to be used in this country. The wood contains a resin called "South American copal" that is used in the manufacture of high-grade varnish, and the trees are bled for this, which reduces the quantity of timber available on the market. (110)

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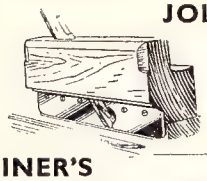

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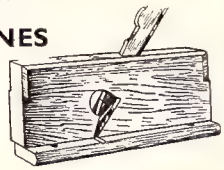

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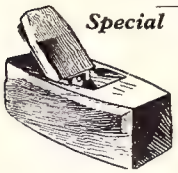

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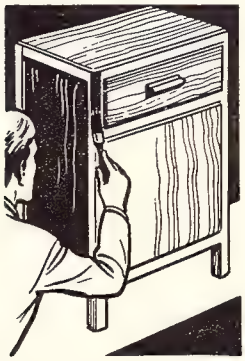

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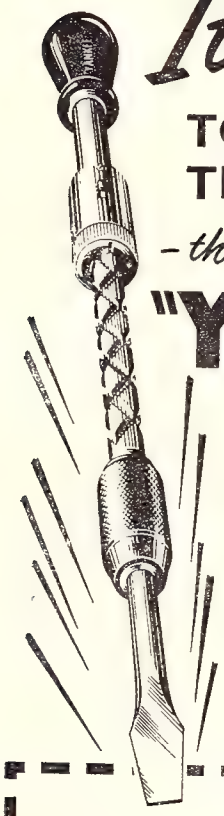

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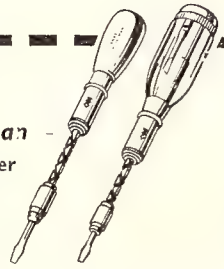

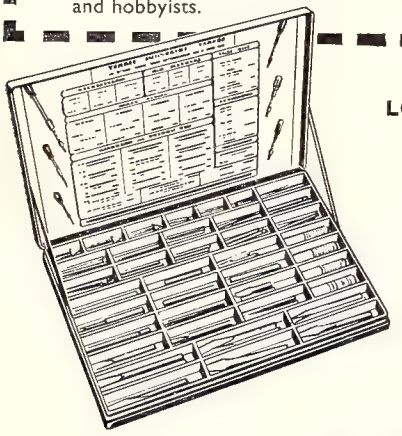

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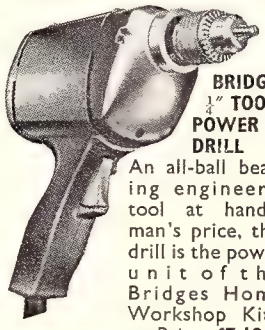

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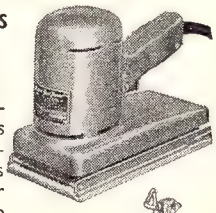

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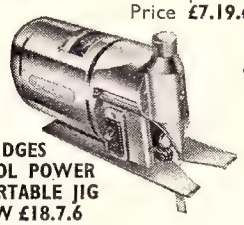

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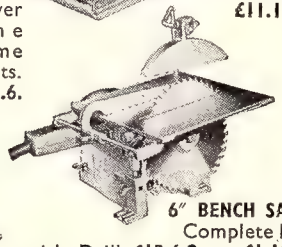

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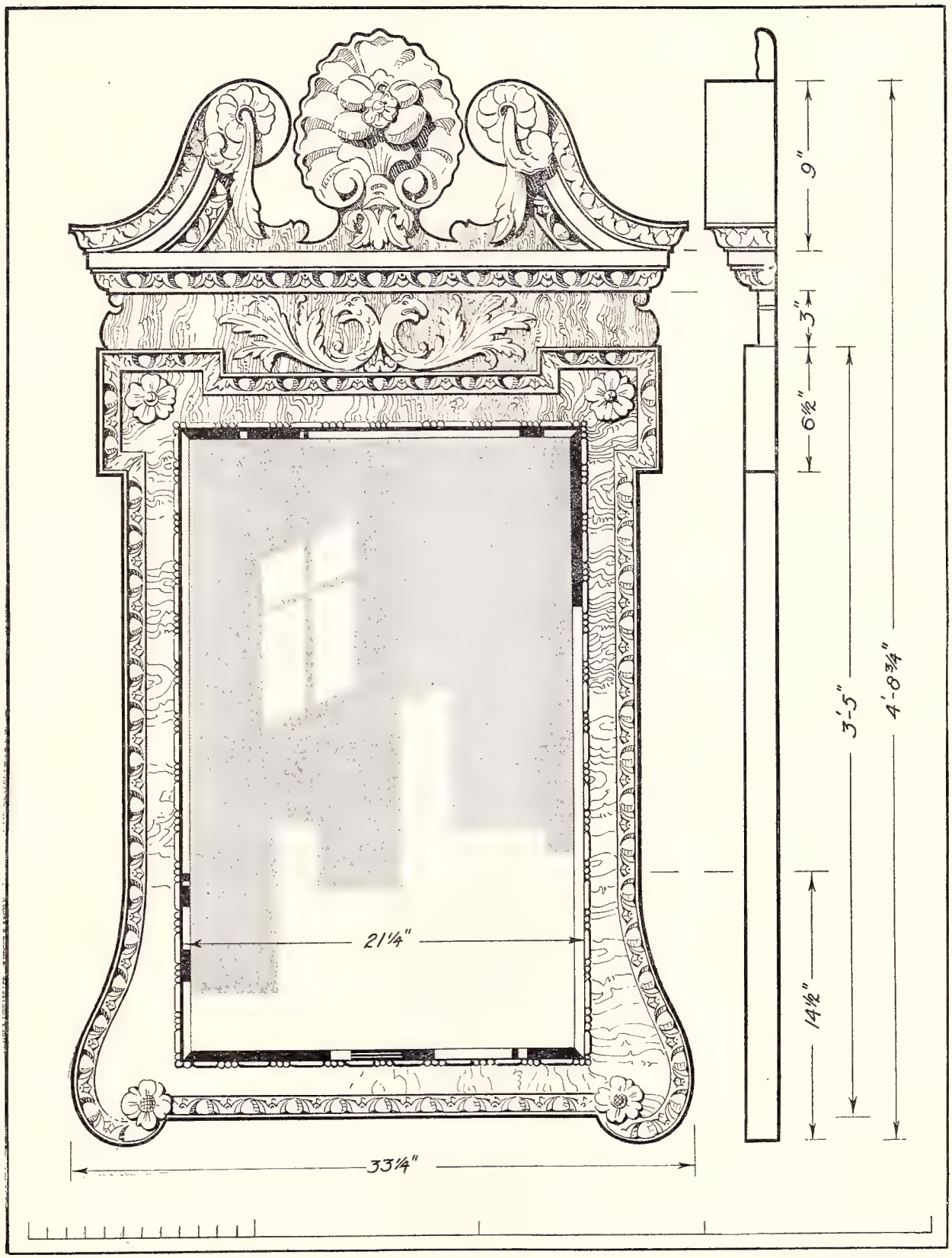

From the original in the possession of M Harris & Sons

(*See description on page* 34)

EXHIBITION OF

English Taste in the Eighteenth Century

This exhibition, which has been organised by the Royal Academy of arts, Burlington House, Piccadilly, remains open until February 26th, 1956, weekdays 10 a.m. to 7 p.m., Sundays 2 p.m. to 6 p.m.

THE eighteenth century has often been referred to as the golden age of cabinet making, and certainly it was a period when that craft seemed to reach its highest level of both taste in design and quality in craftsmanship. There were many affluent patrons who were able to afford to build houses and furnish them, and who had the taste and discrimination to do it well; and there were craftsmen and artists who were able to meet their demands. Perhaps that is the wrong order in which to put it. It may be that the furniture making trade at that period of its development had produced a large number of highly skilled men, and that there were enough wealthy men to use their skill. Probably it was a combination of both, one of those curious phenomena that occur from time to time, in which a surging of high ability coincides with an appreciation of good design and craftsmanship.

It reflects an age now almost completely gone. It had the dignity which goes with more leisured times; an age of many faults and abuses; an ignorant age so far as the masses were concerned; yet a time which produced the finest furniture ever made in this country—and, as many think, ever likely to be produced at any future time.

The eighteenth century was interesting in many ways. The trade of the cabinet maker, the man who made furniture only as distinct from the carpenter who made almost anything in wood, had only recently come into being. By 1700 it had become established, and a number of workshops had been opened in London and the larger provincial cities and towns. Very little is known about these early cabinet makers. Though a few names have been handed down, practically nothing is known of the men as individuals. They worked almost entirely in walnut veneered on oak or pine, using solid walnut only for such parts as legs, etc., which could not be made in any other way.

By about 1715 mahogany began to supersede walnut as a fashionable wood, and on the repeal of the tax on imported timber in 1733 it almost completely replaced it. From the middle of the century and onwards various now well-known names became attached to the trade, and have since been accepted as the titles of certain styles, chiefly on the strength of these worthies having published books of designs. These books, however, were little more than catalogues of the things they made and they represent the general trend of design in the trade rather than the individual style of the particular cabinet maker. This is shown largely by the way in which a cabinet maker, whose name is now established for the style of work shown in his published books, had to change his type of design entirely to meet a changing fashion of cabinet work.

FIG. 1. MAHOGANY COMMODE ATTRIBUTED TO CHIPPENDALE

This is very similar to a design dated 1753 in the 1st edition of Chippendale's "Director" (1754). The carving and cabinet work are of excellent quality. The sides bow outwards towards the front. Size 32 in. by 42 in. by 25 in.

John A. Arnold-Forster Esq.

The two illustrations on these pages have been partly chosen because they illustrate the point well. Both items are attributed to Chippendale. The first, Fig. 1, is entirely in what is known as the Chippendale style, and indeed an illustration of a similar piece appears in his "Director," the book he published in 1754. It is a mahogany commode made at about the middle of the century. It has its decoration entirely in carving and shows French influence in its scrolled legs, Rococo carving, and general form. It is typical of many of the items to be found in the "Director." In Fig. 2 we have an entire change. Although probably made by Chippendale it is most certainly not in what we now know as the "Chippendale" style. It is remarkable in showing how extraordinary a difference had taken place in about 20 years. The decoration is almost entirely in inlay and cross-bandings and elaborate metal mounts. Nothing like it appears in any of his books. Curiously it again shows French influence, though it is of the style associated with Louis XVI rather than

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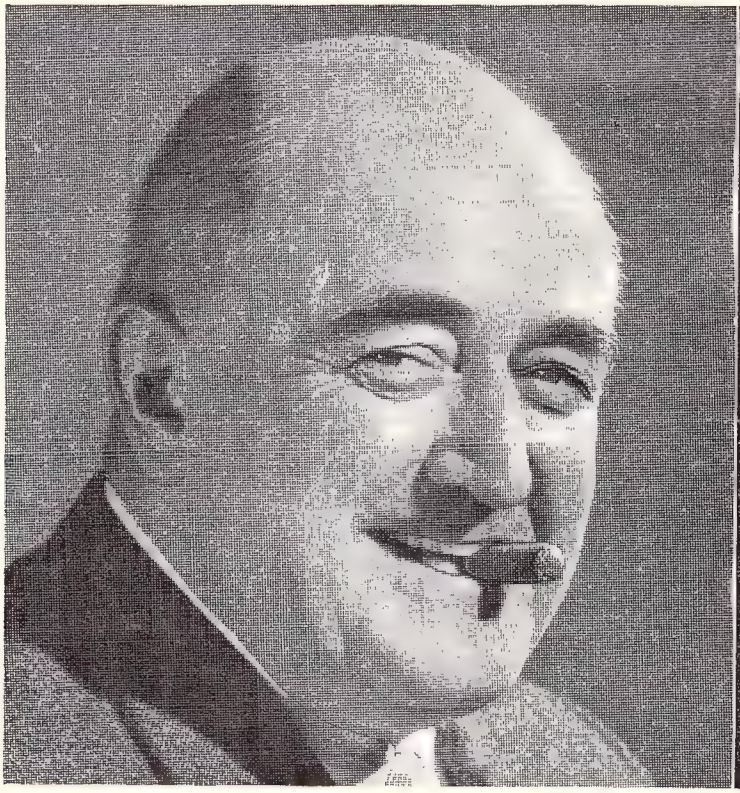

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Obeche	1/-	9d.	7d.	4d.	Pale Cream
Agba	1/6	1/2	1/-	6d.	Deep ,,
Birds Eye Maple	3/9	3/2	2/6	1/3	White
Sweet Chestnut	1/1	10d.	8d.	5d.	Pinky Brown
Nigerian Walnut	1/4	1/1	10d.	5d.	Gold Brown
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Elm	1/9	1/5	1/1	8d.	Middle ,,
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Louis XV. Fashion in France had changed equally with that here.

The exhibition at Burlington House is full of interest. There are many pieces on show not normally accessible to the public, and they show in a delightful way exactly what the title of the exhibition suggests. They are divided into five periods: the *Baroque*, which includes the quiet and restrained items usually associated with Queen Anne, and the more elaborate and even theatrical work of William Kent; the *Rococo*, which includes the earlier work of Chippendale; the *Chinoiserie* as exemplified in Chinese Chippendale style; the *Gothic*, again exemplified in a Chippendale phase known as Gothic Chippendale; and the *Neo-Classic*, which includes the period of Adam, Hepplewhite, and Sheraton.

All the pieces show a high level of craftsmanship, though some are of outstanding quality. Taking Fig. 1 for example, there are many commodes in existence much more elaborate both in general shaping and detail, but in quality of workmanship this is in the first class. The carving in the legs and in the drawer rails is exquisitely wrought, and has a cleanness of finish combined with spontaneity of modelling seldom equalled. Whether it came from Chippendale's workshop or not, it was certainly the work of a master craftsman. Much the same applies to the Fig. 2. The detail of the inlay is excellent, and, so far as general cabinet work is concerned, there is no need to remind the practical reader of the high craftsmanship it would have demanded. Note in particular the elliptical surrounds to the door panels, which are hollow in section and thus involve compound curvature.

FIG. 2. INLAID SATINWOOD COMMODE ATTRIBUTED TO CHIPPENDALE
Classical design; doors veneered with satinwood banded with mahogany and tulip wood, ovals inlaid with flowers in vases; pilasters mounted in ormolu with ram-headed capitals. Size 35½ in. by 58 in. by 24¾ in. About 1770 *The Lady Lever Art Gallery*

To all people interested in the arts and crafts of an age that has passed, the exhibition shows in a delightful way the sort of things the Georgians loved to put into their homes. Naturally furniture was an extremely important item, and the range of high quality woodwork to be seen is a tribute to the skill of the craftsmen and the taste of those who ordered such things for their homes. (160)

NEW 6-IN. SAW BENCH. We have carried out some tests with the *Myblo Minion* saw bench and found it an extremely useful general-purpose machine for light work. It has a 6-in. saw driven by a ⅓-h.p. motor and a 12 in. by 9 in. table grooved to take a mitre block. An adjustable ripping fence is fitted, this working in a cross groove so ensuring true alignment. The riving knife is removable so that operations such as grooving can be carried out. The motor turns at 2,850 r.p.m. and as the pulley ratio is 2-1 the resultant saw speed is 5,700 r.p.m. which is near the optimum of 9,500 ft. per minute peripheral speed.

Although the saw when new will take a maximum cut of 1¾ in. we found it to be at its best when cutting wood of ⅞ in. and less. When, say, 1½ in. hardwood was being cut we found that the saw slowed up considerably under the load. For such a thickness it is better to run the work through twice, cutting part way in from each face.

The table is a fixture, height adjustment being in the saw itself. The rise and fall is effected by a screw handle. This movement enables operations such as grooving and rebating to be carried out. For this work the addition of a wood face to the ripping fence is desirable to increase its length so that the work is supported beyond the saw. Holes in the fence enable the wood face to be screwed on. Another way in in which these holes are useful is that they enable a tall fence to be fitted. This is an advantage when the edge of a wide board is being grooved in that the increased height enables the wood to be held vertically more easily since there is greater width up to which to press it. The mitre block can be adjusted to angles up to about 80 deg. each side of the square position.

Grooving cutters of ⅛ in., 3/16 in., and ¼ in. are available. They fit to the spindle in place of the saw. For wider grooves the work can be passed through twice. They cut cleanly and quickly. Another useful appliance is the sanding disc which, used in conjunction with the mitre block, is invaluable for trimming mitres, etc. A patented lock-jointing appliance is also made to fit the machine. This is specially useful for box making. The principle is that each cut is made separately, an adjustable metal peg being fitted to engage the groove previously cut. It is imperative that the wood is pressed home in the correct position as any fault in the position of a groove throws all the remaining grooves out.

Details of the machine will be found in the announcement on another page.

"PER FOOT SUPER AS INCH." A reader who requires some 1½-in. African mahogany has been quoted a piece of a 3s. per foot super as inch, and enquires what the term means. Some timber merchants quote the cost "per cube"; others give the price per foot super for the thickness asked for; another group take 1 in. as the standard and quote on this as in the present instance. What it comes to is that you have to take the price and increase it in accordance with the thickness over 1 in. Thus to take the example above, 3s. per foot super as inch, the cost of 1½-in. stuff would be half as much again, or 4s. 6d. per foot super. Had it been 2-in. stuff being ordered at the same price the cost would have been 6s. per foot super.

NEW TIMBERS FOR THE WOODWORKER

7. White and Red Peroba : Mandioquiera : Courbaril

Name	Colour, etc	Weight	Grain	Texture	Working Properties	Natural Durability	Suitable Uses	Country of Origin
WHITE PEROBA	Pale olive-brown, with green or red tints.	45 lb.	Straight or interlocked.	Moderately fine, even.	Variable.	Satisfactory.	Cabinet-work, furniture.	Brazil.
RED PEROBA	Variable from yellowish-red to bright red.	50 lb.	Variable.	Fine, even.	Variable, but usually quite good.	Sapwood may be damaged by borers.	External work.	Brazil.
MANDIO-QUIERA	Yellowish-pink to reddish-brown	40-50 lb.	Interlocked.	Coarse or very coarse.	Variable; not always easy to polish.	Moderately durable.	Furniture, structural work.	Brazil, etc.
COURBARIL	Dark brown, with a darker figuring.	50-65 lb.	Straight.	Moderately fine.	Difficult to work.	Moderately durable.	Furniture, cabinet-work.	Tropical America.

WHEN dealing with timbers from foreign countries considerable confusion may be caused by the use of local names such as "roble" or "peroba" to cover groups of different timbers. The situation is easier for the man on the spot as the title is often followed by some adjective, but without some knowledge of the language this is no help to the ordinary woodworker.

For this reason, "peroba" is dealt with below as two separate timbers, for this group can thus be divided on botanical grounds as well as on the basis of colour.

White Peroba is a furniture and cabinet wood for amateur purposes, though it is also used for cooperage and acid containers. The well-defined sapwood is yellowish and the heartwood is pale olive-brown with greenish or reddish tints. The grain is straight or interlocked, the texture moderately close, and the average weight about 45 lb. to the cubic foot.

Working qualities will depend on the grain, for if this is roey or interlocked there will be some difficulty in planing, more especially with interlocked grained material cut on the quarter. Drilling, mortising, and similar processes can be done cleanly, and the response to finishing treatments is good: the wood planes to a mildly lustrous surface that after being filled properly will give a high glaze in polishing.

The strength properties are exceptionally good, the wood is sufficiently durable for all normal purposes, and it is stable when dry.

Red Peroba. Timbers falling under this classification have a colourless or yellowish sapwood that fades gradually into the heart which is variable in colour from yellowish with a pinkish tinge to brightish red: some specimens have an irregular figuring of dark streaks or patches. Red peroba is finely textured but the grain is sometimes very variable. It is usually a heavy timber, weighing about 50 lb. to the cubic foot, and unless required for its decorative effect is more likely to be used externally than internally in this country.

Although the sapwood sometimes suffers from borer beetle damage the timber is strongly resistant to decay, and preservative treatment is unnecessary. It seasons reasonably well, is sufficiently stable when dry, and has good strength properties.

The working properties are rather variable according to the nature of the grain, but in general the wood works well, with little dulling of tool edges and can be given a good polish.

Both types of peroba timber are obtainable in good sizes, and the bulk of the supply of both varieties is from Brazil. A high percentage of the wood is free of knots, and defects as a whole are not numerous.

Mandioquiera. Another useful timber from Brazil and neighbouring regions is that known as Mandio or, less frequently, as Mandioquiera. Again, this is a name applied to a group of timbers all closely related botanically, belonging to the same genus but of different varieties. This means that there will be some variation in colour, durability, ease of working, and so on, between different consignments of timber all of which are described as mandio, though these differences are not sufficiently marked for the variables to be regarded as distinct, separate timbers. Mandio is a hardwood and should not be confused with a softwood species named manio.

Mandio has a clearly defined sapwood which is a dullish white to yellowish in colour, the heartwood ranging from yellowish-pink to reddish-brown. Some logs show a roe figure that can be quite attractive, but normally the grain is interlocked, the texture coarse or very coarse, and rather uneven, while the weight is variable from 40 to 50 lb. to the cubic foot. The more decorative species are used for joinery, furniture, and cabinet-work, and the unfigured stock for structural and external purposes.

This is a timber with high strength properties and fairly good resistance both to fungal and insect attack: it is not the sort of wood that is likely to need preservative treatment in this country. The seasoning properties are also good, and it appears to hold its place well when dry. Timbers of good size can be obtained, and some samples appear to be particularly free of knots and similar defects.

The lighter coloured species of mandio are the easier to work, some of the dark red varieties being quite hard. Samples with roey grain need some care in planing, but in all cases really sharp, thin-edged tools are needed to get satisfactory results in all processes. Glue, screw, and nail-holding properties are quite good, the wood will mortise and drill well, and also stain evenly. It is not always a good species for polishing and may need considerable work to be put in before a good glaze can be achieved.

Courbaril. South and tropical America are also the home of courbaril, or West Indian locust.

This is a furniture and cabinet-work species, orange-yellow to dark brown in colour, with a darker, striped

(*Continued on page* 34)

A jack plane wastes 9 minutes in 10!

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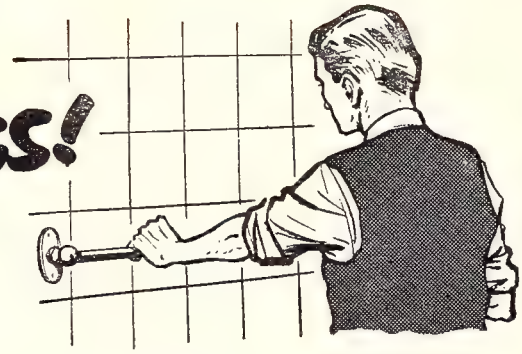

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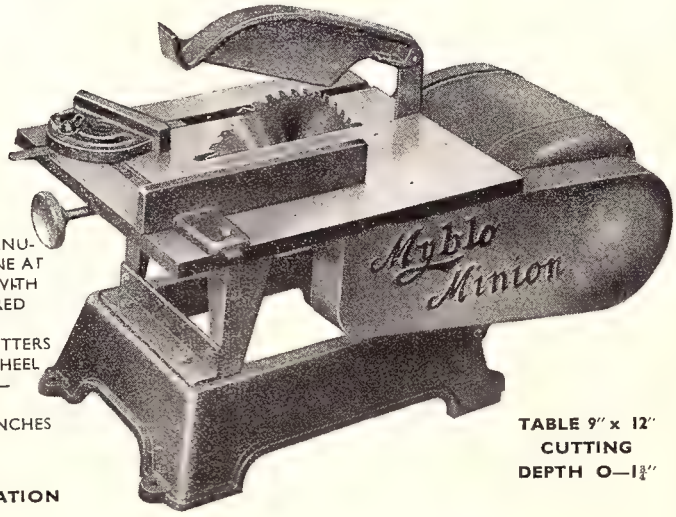

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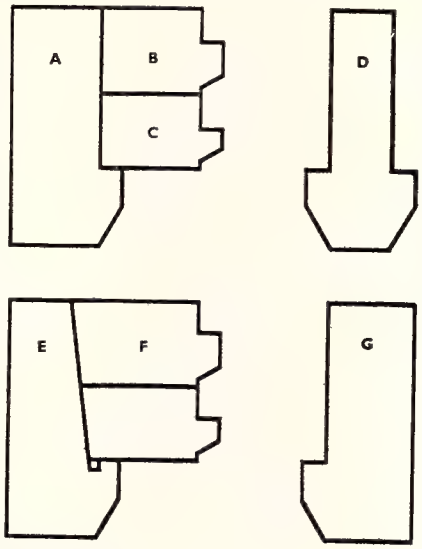
FINISH FOR TEAK DRAINING BOARD *N.S. (Guildford) has a teak draining board. It has been polished with raw linseed oil, and he enquires whether a sealing coat of any kind is desirable.*

Reply.—Owing to the fact that draining boards are mostly always wet it is generally undesirable to treat them in any way. It is for this reason that teak is usually employed, its natural oily nature making any treatment unnecessary. At the onset, boards are often oiled-in with linseed oil, but as they are thereafter always wet nothing further is done. We do not think the application of the sealer you mention will be of much avail. If treated at all we feel it should be thorough, waiting until it is thoroughly dry after complete washing and rinsing, and giving it several coats of a synthetic lacquer such as *Valspar* clear. The first coat is preferably thinned with white spirit and applied sparingly with a rag. Provided the grease is well washed off the oiled-in surface should prove a good ground for further treatment. (116).

FRAMED GLASS UNITS *R.F.H. (Midhurst): "In connection with a bungalow I am building, I should be grateful for advice regarding the large double-glazed windows. The largest are 7 ft. by 5 ft., and I should like to know the sections to use. I imagine that I shall have to use ¼-in. plate glass?"*

Reply.—With glazing of 32 oz. the job will be considerably reduced in cost. For the timber sections we suggest those given here. Since these frame units will form the bulk of the carcase structure, it will not be wise to cut them too fine, more particularly as you require double sashes. These sections are based upon the type of double sash used largely in Swedish house joinery where the two sashes are clamped together with a form of clip or with slotted plates and stubbs, this being necessary for cleaning the glazing. It allows about the right amount of spacing to obtain the heat insulation.



A. Jambs
B. Sash Frames
C. Inner Frames
D. Mullions
E. Sills
F. Bottom Sash Frame
G. Heads

An alternative method would be to rebate the frames on the inner edge, hang the glazed sashes with butt hinges, and fasten with cockspur fasteners. The fit of the sashes would need to be good to prevent heat losses. The construction is straightforward. Through-tenon and wedge mortise all frames, scribing any sections needed in conjunction with the rebates. (690)

BLEACHING DIFFICULTY *R.S. (Braintree): "In liming and waxing an oak suite we had to strip some polish and wash down. We bleached with oxalic acid, afterwards killing with acetic acid and washing, following with liming and waxing. After three weeks it became blue-black in patches. We cured this with oxalic acid, but it was not permanent."*

Reply.—1. It is risky to use oxalic acid on any timber containing tannic acid such as oak. It can be specially serious if the timber is solid since, unlike veneered work, there is no glue barrier to prevent deep penetration of the bleach. The result is that the neutralizing process, unless done with meticulous care, leaves traces of bleach in the timber. These react with the tannic acid present and in due course the black marks you describe appear. The writer favours borax—one ounce to half a gallon warm water—for neutralizing. Vinegar is an acid which will not neutralize another acid.

2. Your bleaching method is in any case rather unpredictable and dated. Use a good two-solution proprietary bleach. The method is important and briefly is as follows: Sand to specification before bleaching; use grass or nylon brushes; use non-metallic containers; shake the No. 1 solution before use; five minutes later apply No. 2; allow one day at least for drying; use 6/0 garnet to remove the white deposit; wear a mask; wash down well with meth. The bleaching effect is controlled by diluting No. 2 with water.

3. Lime tends to brown a surface slightly. Oxalic acid may be used hot or cold. For quick drying and low penetration use a meth. medium for oxalic.

4. You will now appreciate that the marks are quite deep. Spot bleach them with bleaching powder, or hydrogen peroxide 100V. You must, of course, leave the job for a few weeks to see if the stain spreads out again, in which case repeat. Thereafter the 2-solution bleach may be used. Keep all bleaches off your skin.

Write back in due course. Say if the timber is veneered or solid and how many applications before the marks failed to reappear. This is for statistical purposes to help other readers with valuable technical information as we have helped you. (843)

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(*Continued from page xx*)

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REPLIES TO READERS' QUERIES

OAK GARAGE DOORS AND GATES *F.E. (Ipswich): "I have new oak gates and garage doors. I have been advised to oil them. Is this correct?"*

Reply.—Oiling in new oak with linseed oil is the traditional treatment, but experience has shown that it does not altogether provide complete protection from weathering, when those parts more exposed to the weather take on a dirty greyish tone. There is a possibility, of course, that in some cases this may be due to some laxity in frequent and regular attention. In this method raw linseed oil is applied with a rag, being rubbed in well and all surplus wiped off. Two more applications are given at intervals of a few days. Further applications should be made about twice a year, say in the spring and autumn. On these occasions the work should be first well washed to remove any accumulation of soot or dirt.

A more durable surface (and in the opinion of the writer a more attractive one) can be obtained by the use of copal carriage varnish or one of the new synthetic lacquers. The open grain should be filled first. This can be done with a thin paste of whiting and turpentine plus a spot or two of the varnish or lacquer being used. A more convenient method is to use *Alabastine* mixed to a distemper consistency. The filler should be rubbed in well across the grain and, when dry, rubbed down with fine glass-paper until the only filler remaining is that which is in the grain. The next step is to "oil-in" with half varnish (or lacquer) and half turpentine, applied with a rag and the surplus wiped off. Paper lightly between coats and apply two or more coats of varnish (undiluted) with a brush. If a dull finish is preferred it can be achieved, after a few days, by "felting" down with pumice powder; a piece of felt or a pad of cloth is dipped in water and then in the pumice, and the surface rubbed over until the shine disappears. (646)

SHOWCASE FOR BOOK *C.T. (Wilmington): Asks advice on details of a showcase for a valuable book.*

Reply.—(A) The height of the open page should be about 2 ft. 9 in. from the floor.

(B) The margin around the book should be about 4 in., but the point to keep in mind is the effective lighting of the exhibit without shadows in the position chosen for the showcase.

(C) There are several methods of securing the case varying with the construction. Probably you will decide to construct a case that will sit over the book and secure to the table part of the stand. In this case it is possible to fit a link lock into the bottom rail of the case at one end and locking to the base. A slotted stub and plate can be fitted at the opposite end of the case to complete the fixing. Another method is to have a hasp fitting made to the bottom rail and secured with a lever padlock, the case being hinged to the base at the back.

(D) The distance between the glass top and the book page is again a matter of eliminating shadows on the exhibit. Usually about 4 in. is sufficient.

(E) The pitch of the book is immaterial so long as there is a good light for reading. Usually without a cushion a pitch of 1¼ in. is sufficient.

(F) The glass used should be "polished plate" obtainable in various thicknesses from ⅛ in. upwards. For a small case we suggest ⅛ in.

(G) Any selected straight-grained hardwood can be used such as Cuban mahogany, Austrian oak, sycamore, or walnut but the timber must be selected to ensure a sound job.

As you propose using a cushion be sure that the filling is properly sterilized, to safeguard the book. The question of artificial lighting would need to be kept in mind also. It is hardly possible to suggest a design as you do not give any dimensions of the exhibit or of the location such as, Church, Museum, or private house, but we trust these details will help you. (274)

PARQUET FLOORING *R.C. (Swansea): "I have to lay two parquet floors over existing hollow-boarded ground floors. Some parquet is 3/16-in. thick and is veneered plywood. Others are ⅜-in. thick and will involve a step into the room."*

Reply.—Orthodox parquet is ¼ in. in thickness, usually three times longer than the width. It is laid with glue and pinned with fine panel pins punched in. This method has stood the test of time. One advantage of the herring bone pattern is that it will follow the contours of the floor and be firm without creaking and be solid underfoot.

Your practical knowledge will tell you that the life of a floor laid in veneer, will be strictly in proportion to the amount of wear and the thickness of the veneer. In all cases of laying parquet one has to provide a small threshold to take up the thickness; also provide a skirting fillet to neaten off. Reduce the bottom of doors (before laying parquet) and look to all pipe and wire runs where traps require trimming for access, as parquet once laid cannot be taken up without destruction. (61)

REPRODUCTION OAK FINISH *C.S. (Bootle): "I wish to stain an oak sideboard to reproduction colour with wax finish. I have tried water and oil stains without effect. A proprietary dye seemed better, but sank into the grain, leaving the figure light. I have tried cleaning off, but the finish is dirty."*

Reply.—1. The stains you have used cannot be completely dissolved or bleached out. Clean the surfaces up to the white with the scraper and 2/0 garnet paper, finishing with 5/0. You may leave stain still in the figure.

2. Regard staining as a key operation. Have everything figured out first. Do not experiment on the job. Bichromate of potash from any chemist is one of the original stains used and is therefore suitable for oak reproductions. Stir a heaped teaspoonful into about a tumblerful of warm water. You will get a saturated orange solution with undissolved crystals at the bottom. You must determine the strength required yourself. This will be about one of the bichromate solution to two of warm water. Test on scrap oak. When dry brush on a few coats of button polish. Examine in daylight and adjust if necessary. This stain does not act instantly as do most others.

3. It is not possible or desirable to open up hard surfaces for staining The stain above acts uniformly even on surfaces which vary in density. We think, however, that in your case it will be better to work towards the density required with two or three weaker stainings. This may, in any case, be necessary if there are different varieties of oak present. Apply quickly with rag or sponge. Non-oak parts, if any, must be matched up with your other stains. You must damp down and when dry cut raised grain before staining.

4. Rub over firmly with a fresh rag Seal with one coat of button polish.

5. You could use *Alabastine* for filling. Tint with burnt umber and when dry go over with linseed oil. Any surface filler overlooked during filling and not lifted by the oiling must be removed with an abrasive such as fine steel wool.

6. Next day brush on three coats of button polish in quick succession. When thoroughly hard smooth with fine steel wool. Work along the grain only. Be careful at edges. The job may now be waxed. (809)

KERUING FOR BOAT-BUILDING *W.S.P. (Worcester) inquires whether Keruing is suitable for boat-building.*

Reply.—Keruing is a timber that is commonly used in the Far East for small boat building, though it is rather heavy for the purpose. The timber shows a considerable variation in weight, hence it is advisable to select the light weight samples. The wood is moderately difficult to work in most processes, and has a marked dulling effect on tools; occasionally the grain is deeply interlocked, which leads to trouble in planing. In general, it does not split in nailing except in thin boards, and then only towards the ends or sides of boards. It will bend moderately well after a steaming (not a soaking) process, but the steaming may cause copious resin exudation.

Assuming the boat to be painted, varnished, or similarly processed, it will last well under all normal conditions Sapwood, if present in the plank, is liable to insect attack. If the planks are unseasoned and they are stored for any length of time, it may be found that they tend to split at the ends. (884)

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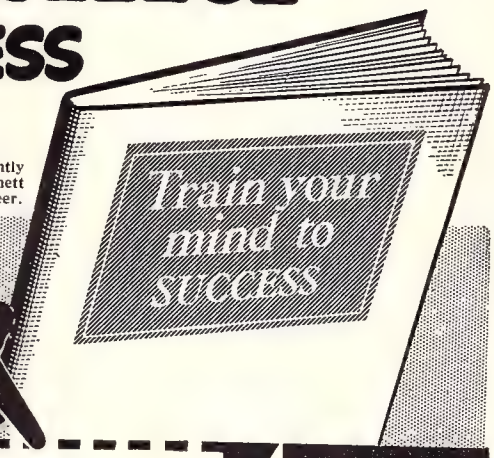

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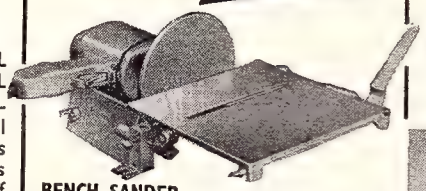

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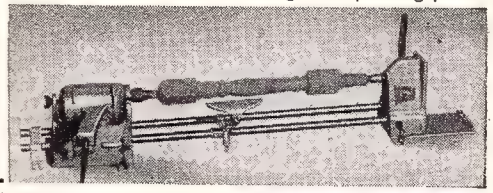

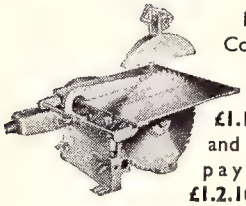

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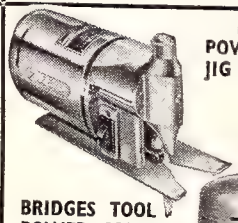

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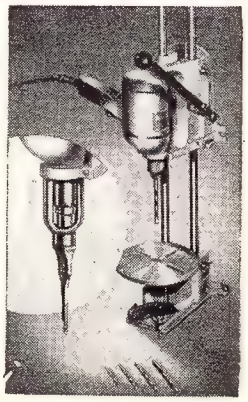

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(Continued on page 39)

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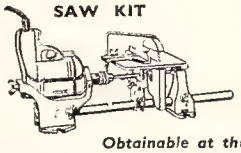

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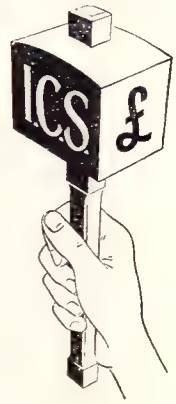

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ICS

HANDICRAFT TEACHERS' PAGE

This is the second of a series of articles on jobs suitable for making in the school handicraft room. In order to make the series interesting, varied, and useful to all handicraft teachers we invite teachers to send in designs which they have found successful in their work. A fee of 2 guineas will be paid for any original design published. Dimensioned pencil sketches with notes describing construction should be sent. A photograph, if available, would be of added help. All photographs will be returned. Designs should be in contemporary style—simple and clean in line and suitable for the average boy to make. The name of successful entrants can be published with the designs if desired.

ATTRACTIVE

BATHROOM CABINET

This cabinet has been designed for fixing to the wall of the bathroom to hold medicines or toilet requisites. It is made in softwood and enamelled to suit the colour scheme of the bathroom

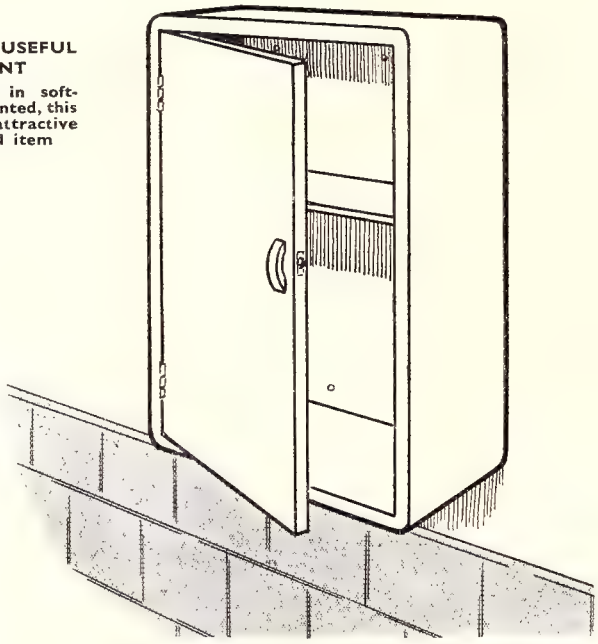

FIG. 1. USEFUL FITMENT
Constructed in softwood and painted, this makes an attractive and usefnl item

THE most suitable corner joints for the carcase are through dovetails with the pins cut on the top and bottom pieces to carry the weight. A simpler joint, more suitable for the beginner, is the barefaced tongue and groove joint as shown at (A) Fig. 3. This joint will need to be held with fine nails as well as glue. It is also advisable to leave 1 in. horns on the top and bottom as in Fig. 3, until the carcase is glued together to prevent short end grain outside the grooves from breaking away.

The shelf, with rounded front edge, is fitted into stopped housing joints $\frac{5}{16}$ in. deep and the plywood back is screwed into rebates cut round the back edge of the carcase. Birch plywood, 12 mm. thick, is used for the door.

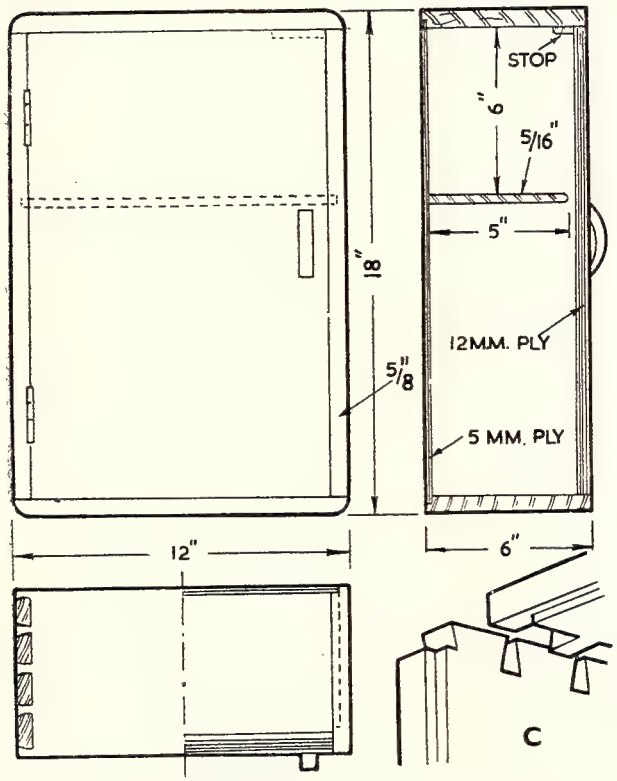

FIG. 2. FRONT ELEVATION, SIDE SECTION, AND PLAN
Detail C shows method, for more advanced workers, of rebating and cutting the pins and tails to accommodate the back

Preparation.—True up the wood for the two sides, top and bottom. If the joints are to be dovetailed these will be 18 in. and 12 in. long respectively. If the tongue and groove joints are used the sides will be $17\frac{1}{4}$ in. long and the top and bottom will be 14 in. allowing for the horns. Cut the joints and fit and mark their positions.

True up the wood for the shelf and mark and cut the housings. Allow for $\frac{3}{8}$ in. setting back from the front edge of the shelf, and 5 mm. for the rebate at the back. Fit the shelf by cutting away the corners to allow for the stopping back, and round over the front edge with smoothing plane and glasspaper.

Although primarily intended to help handicraft teachers, this design is equally useful to the general reader

Cut the rebates to take the plywood back. It will be seen from Fig. 3 (B) that the rebates on the top and bottom must be stopped at the ends to prevent them from showing. It is advisable to stop each end back for a distance of at least 1 in. until after assembling to prevent the small corners from breaking away. As these stopped rebates are short they will have to be cut with chisel and finished with the bullnose plane. Alternatively the top and bottom rebates can be taken right through, in which case the back dovetail and pin is worked out and cut as indicated in Fig. 2 (C).

Assembly.—Clean up the parts and glue the carcase together, fitting the shelf into position at the same time. Leave it cramped square until the glue sets. Extend the

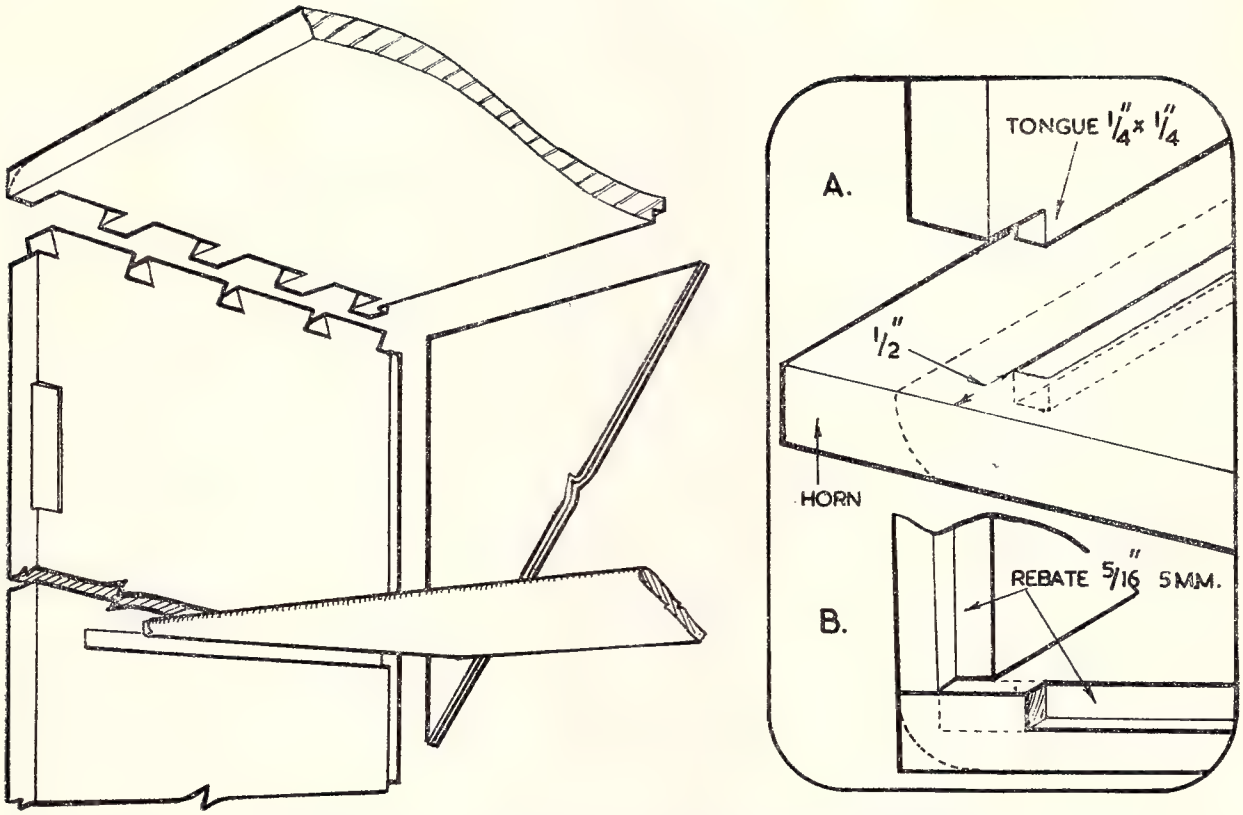

FIG. 3. METHOD OF CONSTRUCTION WITH SIMPLE ALTERNATIVE

Through dovetails are used at the corners, or as an alternative, the barefaced tongue and groove. In the latter case a horn (A) is left on at the corners to prevent possible splitting when gluing and pinning together. The top and bottom rebates (B) are trimmed to meet the sides after the carcase has been glued together

stopped rebates, Fig. 3 (B) on the top and bottom to the corners with a chisel and fit in the plywood back. The back is preferably held with fine screws but panel pins will serve.

Cleaning Up.—Cut off the horns (if any) and clean up the outside surfaces of the carcase. Mark the quadrant curves on the corners to $\frac{5}{8}$ in. radius and skew plane these off with the smoothing plane. Final smoothing may be done with glasspaper.

Fitting the Door.—Plywood 12 mm. thick is used for the door. Plane the edges to fit neatly in the carcase. Attach a pair of $1\frac{1}{2}$ in. brass hinges to the hanging edge of the door, sinking them into the wood to the depth of a plate. Set the door in the carcase and mark the positions for the hinges on the side. Sink the hinge into the carcase side to the depth of a plate and screw the door into position, using one screw in each hinge to test for a good fit.

Glue and nail a piece of plywood, 2 in. by $\frac{3}{4}$ in., under the top as shown in Fig. 2 to act as a door stop. Remove the door and fit a $\frac{3}{16}$ in. ball catch to the striking edge. Make a door handle or knob to a suitable design and fix to the door with glue and screws or dowels. Screw the door finally into position and fix the striking plate for the ball catch.

After glasspapering thoroughly the cupboard should be enamelled before fixing to the bathroom wall with either mirror plates or screws driven through the plywood back.

CUTTING LIST

	Long ft.	Long in.	Wide in.	Thick in.
2 Sides	1	$6\frac{1}{2}$	$6\frac{1}{4}$	$\frac{5}{8}$
1 Top	1	$0\frac{1}{2}$	$6\frac{1}{4}$	$\frac{5}{8}$
1 Bottom	1	$0\frac{1}{2}$	$6\frac{1}{4}$	$\frac{5}{8}$
1 Shelf	1	0	$5\frac{1}{4}$	$\frac{5}{16}$
1 Back	1	$5\frac{3}{4}$	$11\frac{3}{4}$	5 mm.
1 Door	1	$5\frac{1}{4}$	11	12 mm.

1 Pair $1\frac{1}{2}$ in. brass hinges
1 $\frac{3}{16}$ in. ball catch.

Allowance has been made in lengths and widths. Thicknesses are net. (25)

Timbers for Woodwork.—The original edition of this book was published soon after the close of the war when the supply of timber was still extremely difficult. Nobody knew what timbers were generally available, or what was likely to be available in the future. The book was consequently largely confined to timbers with which we were familiar before the war. The position has changed considerably during the last year or two. Many timbers are now being imported which were almost unknown outside the country or their origin. The above book has now been completely revised and enlarged to include these many "new" timbers. Over 230 timbers are given with all useful data, including weight, origin, uses, working qualities, and so on. The book has over 232 pages and is illustrated with maps, diagrams, etc. It measures $8\frac{1}{2}$ in. by $5\frac{1}{2}$ in. and is well bound in cloth on stiff covers. Published at 10s. 6d. by Evans Bros. Ltd., Montague House, Russell Square, London, W.C.1.

5. The Wash Coat : Filling the Grain

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Now the above rather high-flown way of putting it simply means that you will never learn to french polish merely by coming into our shop and listening to us raving about it—that is merely the instruction factor. You have to take off your jacket and get in plenty of practice as well—that is the activity factor. So far as observation is concerned it simply means that it helps to work beside experts and to examine good work. Our substitute for that is sketches and description.

Everyone of course likes to see an expert at work. On jobs outside our shop children will watch us for hours apparently hypnotised ; and their elders are not much better. The bolder ones often ask what the "secrets" are. When we explain that it is just another trade that one learns in the usual way they never seem to believe us.

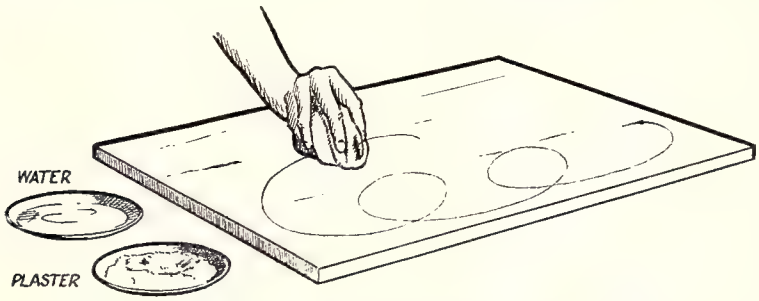

FIG. 1. FILLING IN THE GRAIN WITH PLASTER OF PARIS
The damp rag is dipped into the tinted plaster and applied as shown. Some prefer to apply it across the grain instead of with a circular movement. To remove the surplus rub the rag across the grain before the plaster sets

It takes five years to train a polisher, but that is a young person who knows nothing to begin with, and who is reaching physical maturity at the same time. We know from experience that a woodworker with the skill and knowledge already won can, with instruction, polish satisfactorily almost from the beginning and become competent within months. The old cabinet-makers often used to do their own polishing. Many charge-hands in polishing shops are ex-woodworkers who have taken up the finishing side because it interests them more. Polishing is one of those crafts where you have got to do everything right, for mistakes can be costly.

Wash Coat.—When the job is stained and dry rub it over with a rag—firmly in the case of stains which act as dyes and lightly in the case of pigmented stains. This will remove any tendency to grain raising which may still be there and remove any loose matter on the surface such as bicro. dust. Thereafter the surfaces should be sealed with a coat of polish.

This sealer coat, or wash coat as it is usually called, serves three main purposes. It permits easy wiping of the grain filler which comes next ; it prevents the colouring agent in the filler from being absorbed by the surface so altering it ; and it stops the liquid part of the filler from being absorbed quickly into the pores, thereby leaving the filler base unbound or loose. The wash coat will be completely absorbed except on very hard woods. Nevertheless it does seal the stain and consolidate the surface fibres.

To apply the wash coat dip up fairly wet and cover the surfaces across and then along the grain in quick succession. The rubber should be wet with no noticeable drag. If you are charging a new rubber for the first time hold it in the polish jar for about twenty seconds. Note how the polish level drops. That first charge costs about ninepence. Squeeze out gently, keeping the rubber shape, and cover the work evenly with light pressure. Use the mop on carvings or similar detail. If the wood is hard dilute the polish 25 per cent. Do not use any oil on the rubber ; it should in any case work well without it. Dip up as required to keep the rubber well charged and moving easily. Control the pressure so that the polish is fed on to the surface without runs.

Filling.—The wash coat needs about 30 minutes to harden, after which the grain should be filled. Filling is necessary on woods which have an open grain—which includes most hardwoods. They can take in a surprising amount of polish. The main purpose of filling is to provide a dense flat base for the varnish film and to save time and material. Filling is essential for a high finish as this readily shows the numerous tiny indentations which indicate unfilled or badly filled pores.

The qualities required in the ideal filler are that it should not shrink nor swell ; it should be inert, that is there should be no reaction between it and the varnish or solvents ; it should retain its colour and handle easily ; it should become as hard as the timber and no more absorbent. The perfect filler has still to be invented, but there are plenty which come near enough to it.

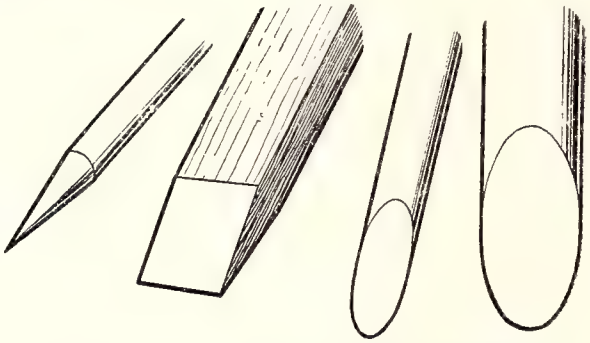

FIG. 2. SHARPENED STICKS FOR REMOVING FILLER
These are handy for scraping surplus filler from corners, mouldings, carved detail, etc.

Fillers which consist of mixtures (these tend to separate in the can) must be well stirred before use. Remember that it is going into tiny separate compartments, each of which must have its proper share of the ingredients. Usually, prepared fillers require thinning. The more open the grain the thicker the filler should be. About soft butter consistency is right for coarse woods and cream consistency for the fine ones. Many bought fillers are a neutral grey and need tinting before use.

(*Continued on page* 34)

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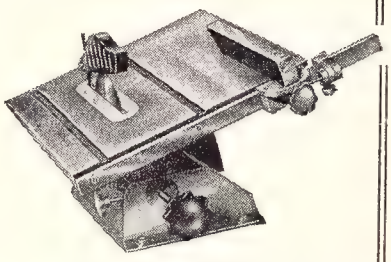

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1" x 3" "	5¼d. "	¾" x 6" "	8¼d. "
1" x 4" "	7½d. "	⅞" x 6" "	9¼d. "
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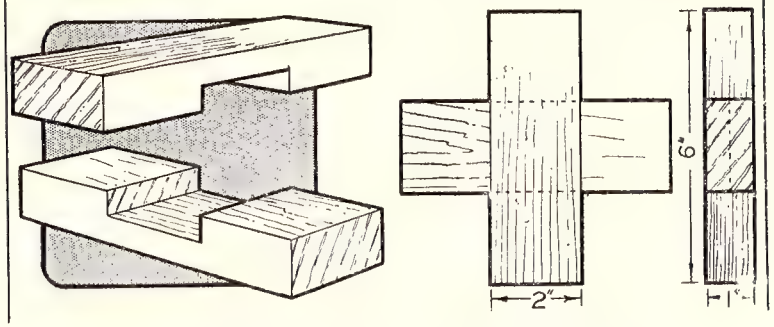
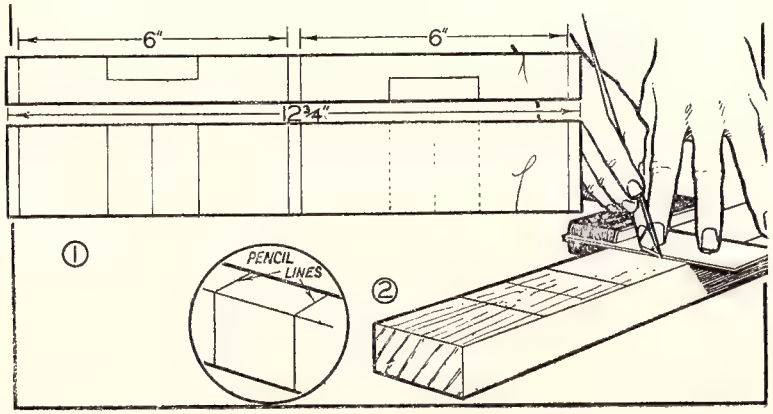
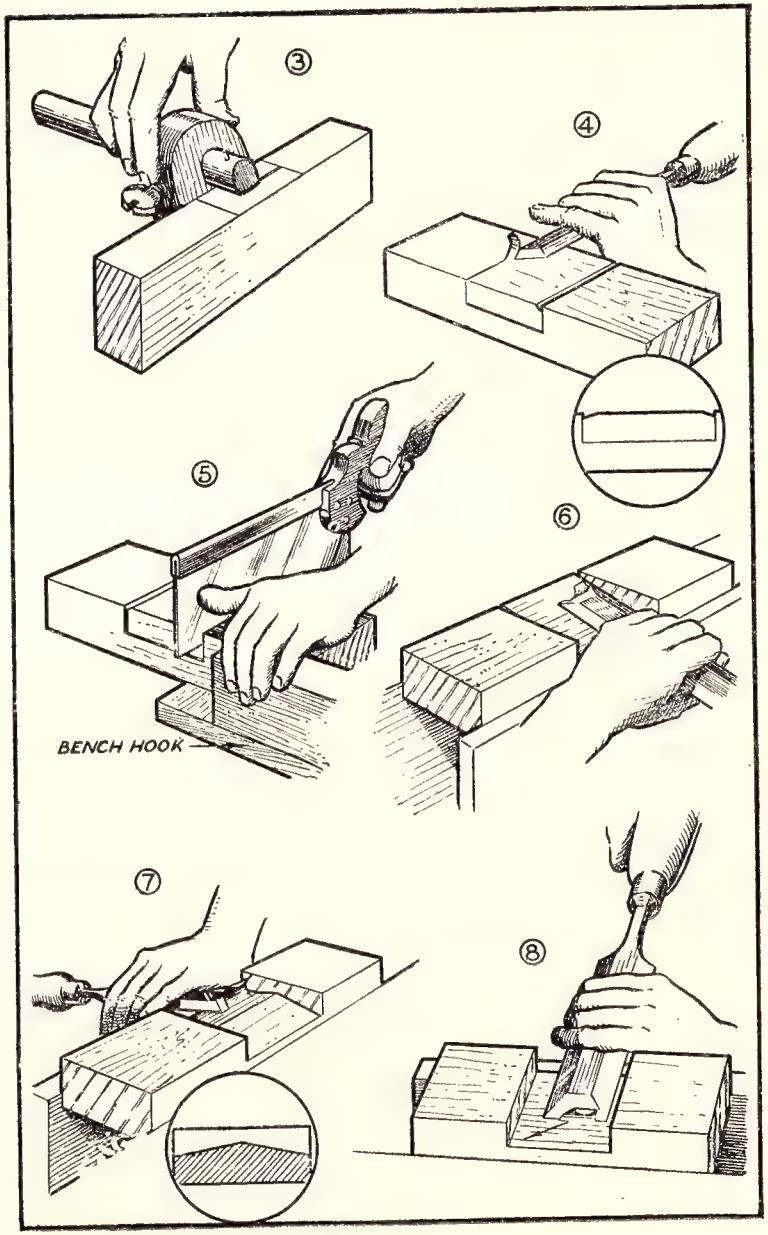


The cross halving is one of the simplest to make and is found in some form or other in most cases where frame construction is used.

1. Prepare the wood and mark out. Note that the joint is marked on opposite faces.
2. Separate the sections and, placing the one piece on the other, mark the width. Square across with marking knife.
3. Gauge from face side only. Depth of groove is half the thickness of wood used.
4. Chisel sloping grooves on the waste side of the lines to form channels for the saw.
5. Saw down to the gauge line.
6. Chisel away waste wood from one side down to the gauge line.
7. Reverse and repeat as for 6.
8. Finish by paring with a chisel, using a slicing movement. (163)





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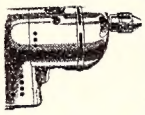

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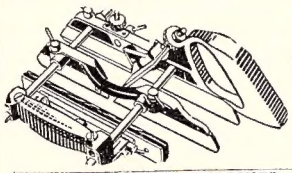

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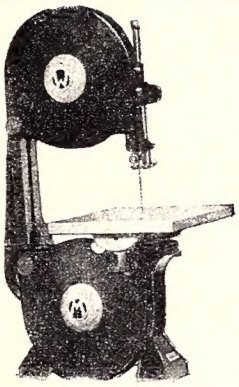

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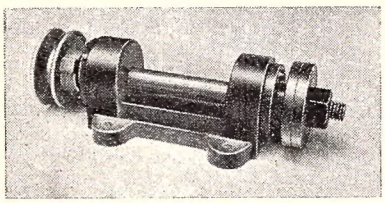

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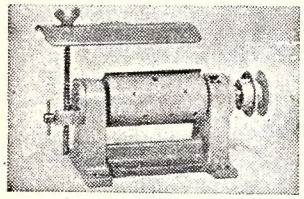

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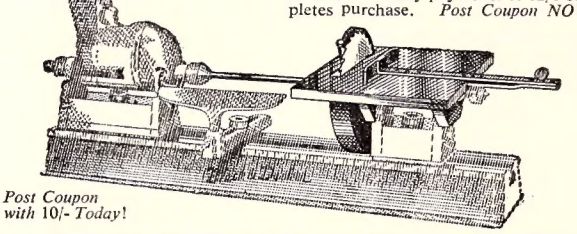

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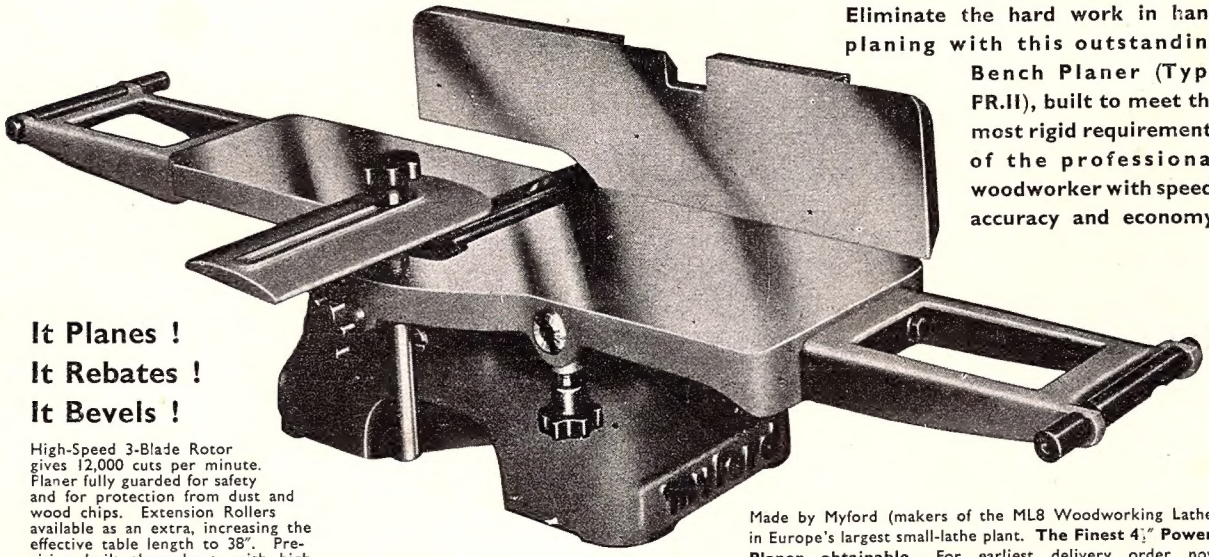

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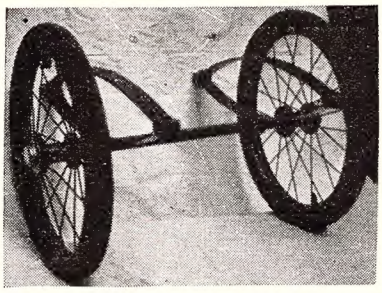

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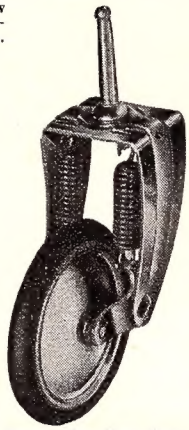

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Published by the Proprietors, EVANS BROTHERS LTD., at Montague House, Russell Square, London, W.C.1
Agents for South Africa, Central News Agency Ltd.
Registered for transmission by magazine post to Canada and Newfoundland.
Annual subscription 15s. 6d. post free; U.S.A. $2.00; Canada $2.00.
Printed in Great Britain by Gibbs and Bamforth Ltd., St. Albans, Herts.